F/P (K)

Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD
MAY 06 2019
RECEIVED

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. NMNM023199	
6. If Indian, Allotee or Tribe Name	
7. If Unit or CA Agreement, Name and No.	
8. Lease Name and Well No. CAMELLIA FED COM 26 36 21 121H (325400)	
9. API Well No. 30-025-45897	
10. Field and Pool, or Exploratory ~~JAL / WOLFCAMP WEST~~ WOLFCAMP (98234)	
11. Sec., T. R. M. or Blk. and Survey or Area SEC 21 / T26S / R36E / NMP	

1a. Type of work: ☑ DRILL ☐ REENTER
1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other
1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

2. Name of Operator: AMEREDEV OPERATING LLC (372224)

3a. Address: 5707 Southwest Parkway, Building 1, Suite 275 Austin TX
3b. Phone No. *(include area code)*: (737)300-4700

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface: LOT M / 283 FSL / 270 FWL / LAT 32.0222961 / LONG -103.2777208
At proposed prod. zone: LOT D / 50 FNL / 200 FWL / LAT 32.05041 / LONG -103.27796

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
5 miles	LEA	NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
270 feet	320	320
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	**19. Proposed Depth**	**20. BLM/BIA Bond No. in file**
720 feet	12560 feet / 23283 feet	FED: NMB001478
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	**22. Approximate date work will start***	**23. Estimated duration**
2924 feet	03/15/2019	90 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Christie Hanna / Ph: (737)300-4723	04/10/2018
Title: Senior Engineering Technician		
Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	05/03/2019
Title: Assistant Field Manager Lands & Minerals	Office: CARLSBAD	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

GCP Rec 05/06/19

APPROVED WITH CONDITIONS
Approval Date: 05/03/2019

KZ 05/06/19

REQUIRES NSL

(Continued on page 2)

*(Instructions on page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160
PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.
ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

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Additional Operator Remarks

Location of Well

1. SHL: LOT M / 283 FSL / 270 FWL / TWSP: 26S / RANGE: 36E / SECTION: 21 / LAT: 32.0222961 / LONG: -103.2777208 (TVD: 0 feet, MD: 0 feet)
   PPP: LOT D / 50 FNL / 200 FWL / TWSP: 26S / RANGE: 36E / SECTION: 16 / LAT: 32.05041 / LONG: -103.27796 (TVD: 12560 feet, MD: 23283 feet)
   BHL: LOT D / 50 FNL / 200 FWL / TWSP: 26S / RANGE: 36E / SECTION: 16 / LAT: 32.05041 / LONG: -103.27796 (TVD: 12560 feet, MD: 23283 feet)

BLM Point of Contact

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@blm.gov

Approval Date: 05/03/2019

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Ameredev Operating LLC
LEASE NO.:	NMNM023199
WELL NAME & NO.:	Camellia Fed Com 26 36 21 121H
SURFACE HOLE FOOTAGE:	283'/S & 270'/W
BOTTOM HOLE FOOTAGE	50'/N & 200'/W
LOCATION:	Section 21, T.26 S., R.36 E., NMPM
COUNTY:	Lea County, New Mexico

COA

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☑ Capitan Reef	☐ WIPP

A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

Primary Casing Design:

1. The **13-3/8** inch surface casing shall be set at approximately **1925** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours

after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

d. If cement falls back, remedial cementing will be done prior to drilling out that string.

❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

- Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.

- Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **9-5/8** inch **1st intermediate** casing is:

   Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

   a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

   b. Second stage above DV tool:

      - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.
        Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

      - Cement to surface. If cement does not circulate, contact the appropriate BLM office.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Excess calculates to 22% - additional cement might be required.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

    - Cement should tie-back at least **50** feet on top of Capitan Reef Top. Operator shall provide method of verification. **Excess calculates to 17% - additional cement might be required.**

Alternate Casing Design:

2nd Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

3. The minimum required fill of cement behind the **7-5/8** inch **2nd intermediate** casing is:

    - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Excess calculates to 14% - additional cement might be required.**

    In the case of lost circulation, operator has proposed to pump down 9 5/8" X 7 5/8" annulus. Operator must run a CBL from TD of the 7 5/8" casing to surface. Submit results to the BLM.

    Pilot hole is required to have a plug at the bottom of the hole. If two plugs are set, the BLM is to be contacted (575-361-2822) prior to tag of bottom plug, which must be a minimum of 200' in length. Operator can set one plug from bottom of pilot hole to kick-off point and save the WOC time for tagging the first plug. Note plug tops on subsequent drilling report.

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:

    - Cement should tie-back at least **50** feet on top of Capitan Reef Top. Operator shall provide method of verification. **Excess calculates to 15% - additional cement might be required.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2.

Option 1:

Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M)** psi.

Option 2:

Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 10,000 (10M) psi.

a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
c. Manufacturer representative shall install the test plug for the initial BOP test.
d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

Variance approved to use a 5M annular. The annular must be tested to full working pressure (5000 psi.)

D. SPECIAL REQUIREMENT(S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log (one log per well pad is acceptable) run from TD to surface (horizontal well – vertical portion of hole) shall

be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
    e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.

g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

NMK4282019

263621M APD Camellia Fed Com 26 36 21 121H 30015 NMNM023199 Ameredev 12-55 03192019 NMK

Cap

13 3/8	surface csg in a		17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	Weight
"A"	68.00	J 55		BUTT	8.17	2.27	0.65	1,925	130,900
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500			Tail Cmt	does not	circ to sfc.	Totals:	1,925	130,900

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	1231	2083	1390	50	8.60	2933	3M	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK. **Alt Burst = 1.18 > 0.7**

9 5/8	casing inside the		13 3/8			Design Factors		INTERMEDIATE	
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	Weight
"A"	40.00	HCL 80		BUTT	2.10	0.79	0.84	10,931	437,240
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	10,931	437,240
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		1925	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	look ↘	0	3485		9.40	4088	5M	0.81
D V Tool(s):			5002				sum of sx	Σ CuFt	Σ%excess
t by stage % :		127	22				2756	6210	78

Class 'H' tail cmt yld > 1.20

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.53, b, c, d **Alt Burst = 1.50 > 1 Alt Collapse = 1.19 > 1.125**

<0.70 a Problem!!

Tail cmt

5 1/2	casing inside the		9 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	Weight
"A"	20.00	HCP 110		BUTT	2.55	1.68	1.8	12,095	241,894
"B"	20.00	HCP 110		BUTT	7.16	1.48	1.8	11,105	222,106
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,661						Totals:	23,200	464,000
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		10931	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 1/2	0.2291	4829	6471	5666	14	10.50			1.23

Class 'H' tail cmt yld > 1.20

0			5 1/2			Design Factors			
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"								0	0
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	0	0
Cmt vol calc below includes this csg, TOC intended					0	ft from surface or a		23200	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
0			0	0					

Approval Date: 05/03/2019

Cap

13 3/8	surface csg in a		17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	Weight
"A"	54.50	J 55		BUTT	8.13	1.31	1.12	1,925	104,913
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,071				Tail Cmt	does not	circ to sfc.	Totals:	1,925	104,913

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946			1391		8.60	1345	2M	1.56

9 5/8	casing inside the		13 3/8			Design Factors		INTERMEDIATE	
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	Weight
"A"	40.00	HCL 80		BUTT	4.57	1.73	0.82	5,013	200,520
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	5,013	200,520
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		1925	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	look ↘	0	1684		9.40	4161	5M	0.81
D V Tool(s):			3262				sum of sx	Σ CuFt	Σ%excess
t by stage % :		315	37				1357	3882	130

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 1.15, b, c, d
All > 0.70, OK.

Alt Burst = 1.38 > 1

7 5/8	casing inside the		9 5/8	A Buoyant		Design Factors		INTERMEDIATE	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	29.70	HCL 80		BUTT	2.13	1.1	1.36	11,147	331,066
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,452							Totals:	11,147	331,066
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		5013	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0.1005	683	1339	1172	14	10.50	4088	5M	0.56

Class 'H' tail cmt yld > 1.20

Alt Collapse = 1.65 > 1.125

Tail cmt

5 1/2	casing inside the		7 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	20.00	P 110		BUTT	2.61	2.1	2.1	11,147	222,940
"B"	20.00	P 110		BUTT	6.03	1.70	2.1	12,053	241,060
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,452							Totals:	23,200	464,000
Segment Design Factors would be:					23.18	1.87	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	23200	12560	12560	12095	90	12	12871.5

The cement volume(s) are intended to achieve a top of					0	ft from surface or a		11147	overlap.
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
6 3/4	0.0835	1751	2346	2047	15	10.50			0.49

Class 'H' tail cmt yld > 1.20

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PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

Camellia Federal Com 26 36 21 81H:
Surface Hole Location: 283' FSL & 290' FWL, Section 21, T. 26 S., R. 36 E.
Bottom Hole Location: 200' FNL & 660' FWL, Section 16, T. 26 S., R. 36 E.

Camellia Federal Com 26 36 21 91H:
Surface Hole Location: 283' FSL & 310' FWL, Section 21, T. 26 S., R. 36 E.
Bottom Hole Location: 200' FNL & 660' FWL, Section 16, T. 26 S., R. 36 E.

Camellia Federal Com 26 36 21 101H:
Surface Hole Location: 283' FSL & 230' FWL, Section 21, T. 26 S., R. 36 E.
Bottom Hole Location: 200' FNL & 380' FWL, Section 16, T. 26 S., R. 36 E.

Camellia Federal Com 26 36 21 111H:
Surface Hole Location: 283' FSL & 250' FWL, Section 21, T. 26 S., R. 36 E.
Bottom Hole Location: 200' FNL & 380' FWL, Section 16, T. 26 S., R. 36 E.

Camellia Federal Com 26 36 21 121H:
Surface Hole Location: 283' FSL & 270' FWL, Section 21, T. 26 S., R. 36 E.
Bottom Hole Location: 200' FNL & 380' FWL, Section 16, T. 16 S., R. 36 E.

Approval Date: 05/03/2019

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Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Timing Limitation Exceptions:
The Carlsbad Field Office will publish an annual map of where the LPC timing and noise stipulations and conditions of approval (Limitations) will apply for the identified year (between March 1 and June 15) based on the latest survey information. The LPC Timing Area map will identify areas which are Habitat Areas (HA), Isolated Population Area (IPA), and Primary Population Area (PPA). The LPC Timing Area map will also have an area in red crosshatch. The red crosshatch area is the only area where an operator is required to submit a request for exception to the LPC Limitations. If an operator is operating outside the red crosshatch area, the LPC Limitations do not apply for that year and an exception to LPC Limitations is not required.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

Hydrology

- The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.
- Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.
- Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

- Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.
- Automatic shut off, check values, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

- A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

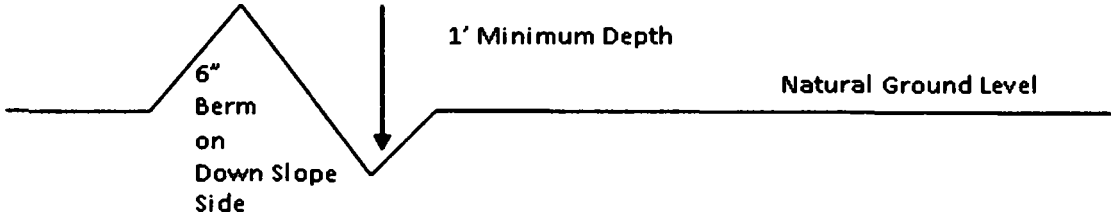
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Cattle guards
An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement
Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

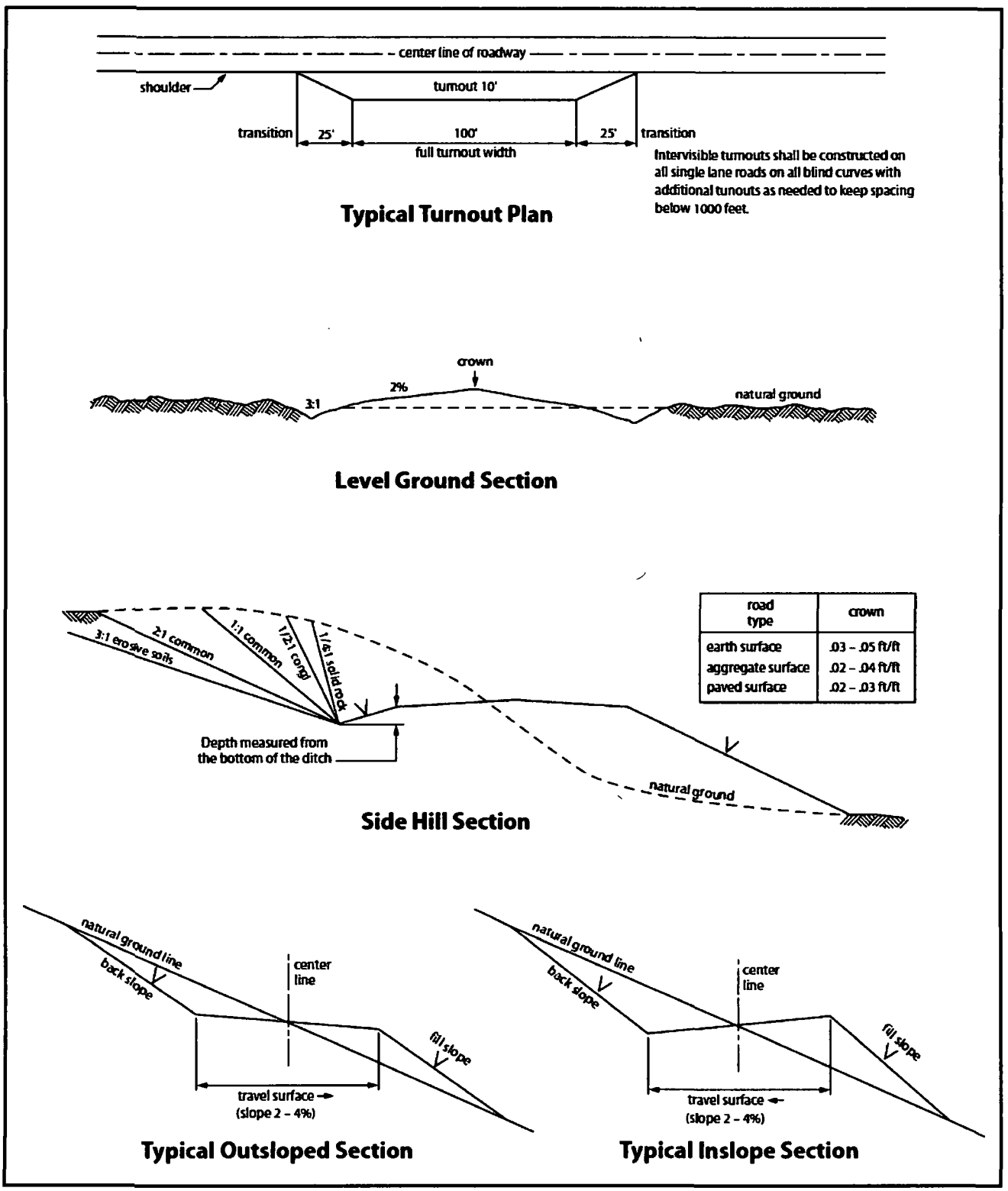


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
b. Activities of other parties including, but not limited to:
    (1) Land clearing.
    (2) Earth-disturbing and earth-moving work.
    (3) Blasting.
    (4) Vandalism and sabotage.
c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-way width of **20** feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline will be "snaked" around hummocks and dunes rather then suspended across these features.

9. The pipeline shall be buried with a minimum of **24** inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green,** Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will

be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

18. Special Stipulations:

a. **Lesser Prairie-Chicken:** Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted.

b. This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of **36** inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be **30** feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **20** feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **30** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately ___6___ inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

( ) seed mixture 1	( ) seed mixture 3
( ) seed mixture 2	( ) seed mixture 4
(X) seed mixture 2/LPC	( ) Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps,

ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

19. Special Stipulations:

Lesser Prairie-Chicken

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b.

A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply

with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:
- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture for LPC Sand/Shinnery Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed shall be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

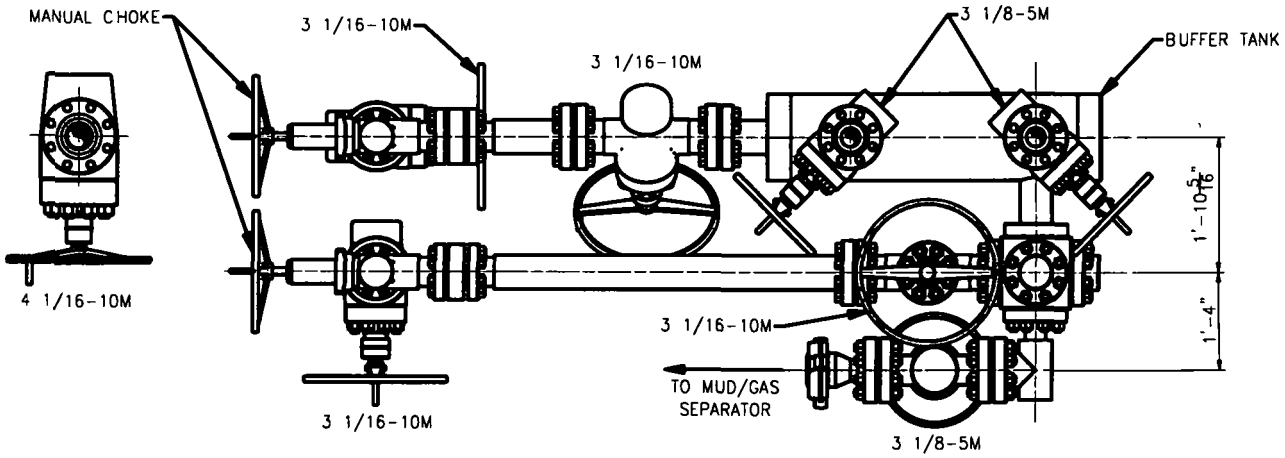
Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). Holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. Seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

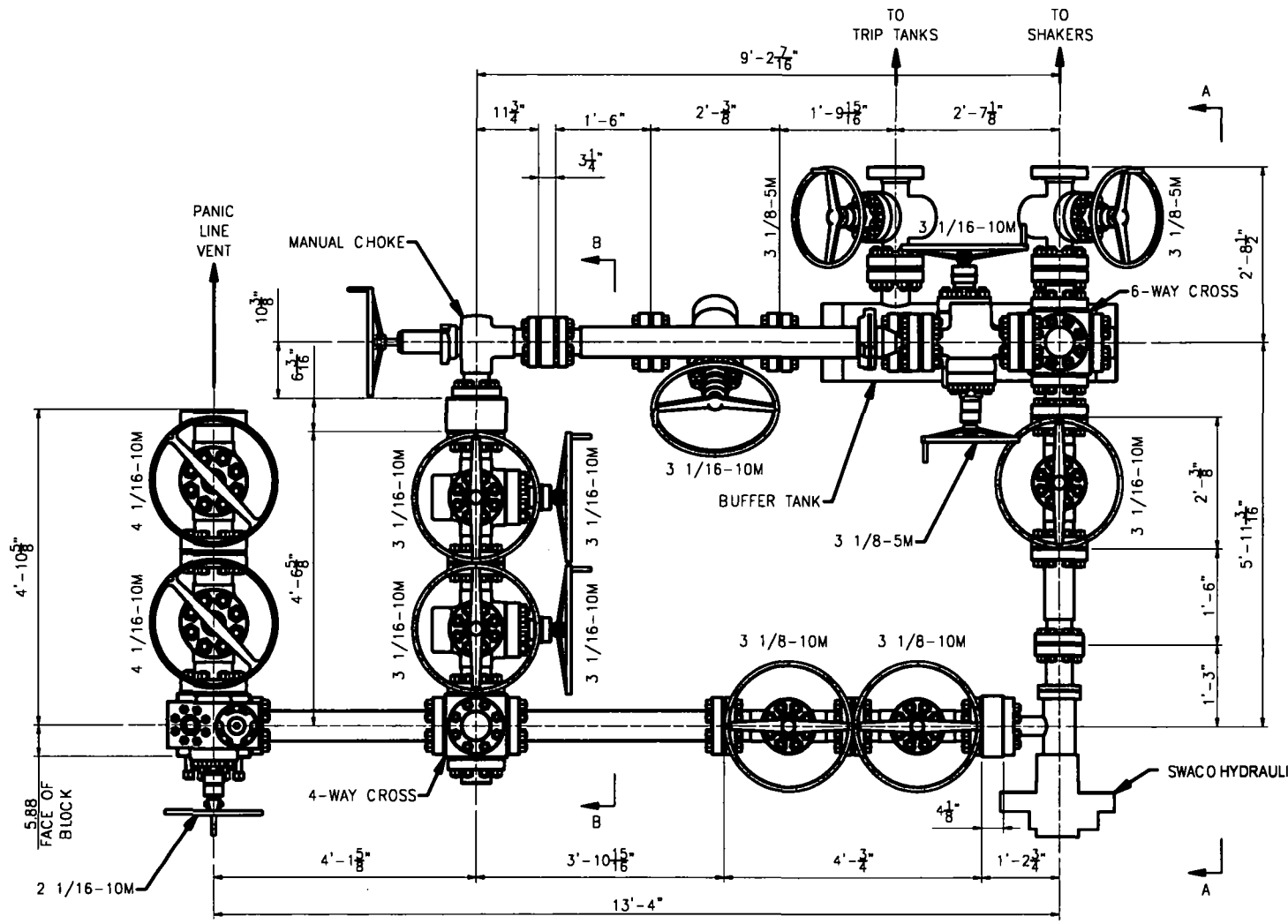
Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

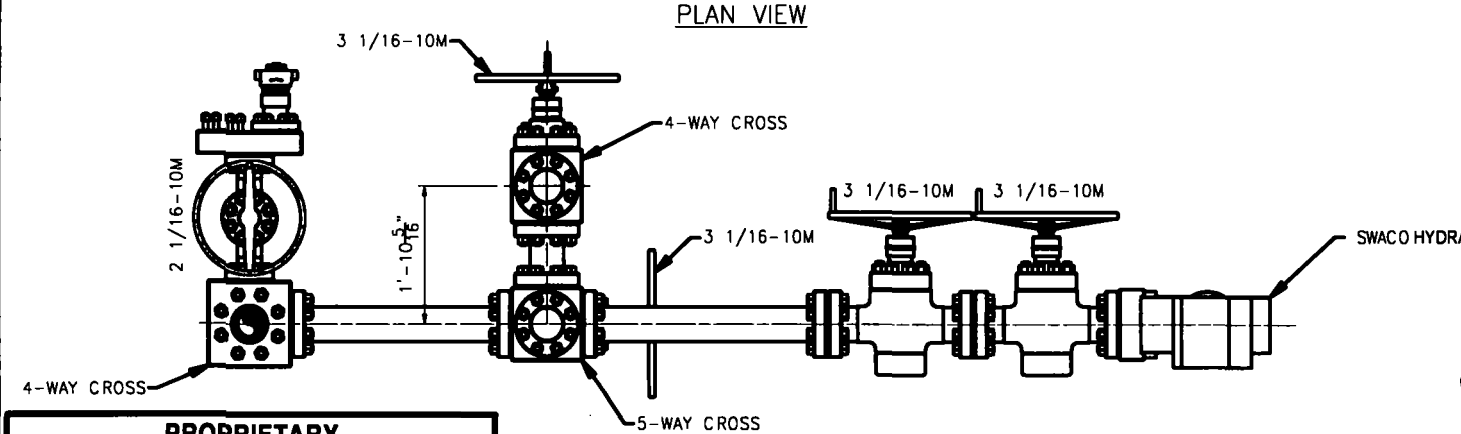
*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed





PLAN VIEW



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U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

05/03/2019

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Christie Hanna **Signed on:** 04/04/2019

Title: Senior Engineering Technician

Street Address: 5707 Southwest Parkway, Building 1, Suite 275

City: Austin **State:** TX **Zip:** 78735

Phone: (737)300-4723

Email address: channa@ameredev.com

Field Representative

Representative Name: Zachary Boyd

Street Address: 5707 Southwest Parkway, Building 1, Suite 275

City: Austin **State:** TX **Zip:** 78735

Phone: (432)385-6996

Email address: zboyd@ameredev.com

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data Report

05/03/2019

APD ID: 10400029259 **Submission Date:** 04/10/2018

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Well Type: OIL WELL **Well Work Type:** Drill

[redacted]

Show Final Text

Section 1 - General

APD ID: 10400029259 **Tie to previous NOS?** **Submission Date:** 04/10/2018

BLM Office: CARLSBAD **User:** Christie Hanna **Title:** Senior Engineering Technician

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM023199 **Lease Acres:** 320

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? NO **APD Operator:** AMEREDEV OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: AMEREDEV OPERATING LLC

Operator Address: 5707 Southwest Parkway, Building 1, Suite 275 **Zip:** 78735

Operator PO Box:

Operator City: Austin **State:** TX

Operator Phone: (737)300-4700

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO **Master Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** JAL **Pool Name:** WOLFCAMP WEST

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** CAM/AZE **Number:** 1N

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 5 Miles **Distance to nearest well:** 720 FT **Distance to lease line:** 270 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: CAMELLIA_FED_COM_26_36_21_121H___BLM_LEASE_MAP_20190313125605.pdf

CAMELLIA_FED_COM_26_36_21_121H___VICINITY_MAP_20190313125609.pdf

CAMELLIA_FED_COM_26_36_21_121H___EXH_2AB_20190313125608.pdf

CAMELLIA_FED_COM_26_36_21_121H___GAS_CAPTURE_PLAN_20190313125621.pdf

CAMELLIA_FED_COM_26_36_21_121H___C_102_SIG_20190313145131.pdf

Well work start Date: 03/15/2019 **Duration:** 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 19642

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	283	FSL	270	FWL	26S	36E	21	Lot M	32.0222961	-103.2777208	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 023199	2924	0	0

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
KOP Leg #1	379	FNL	270	FWL	26S	36E	28	Aliquot NWNW	32.02047	-103.27774	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-9076	12034	12000
PPP Leg #1	50	FNL	200	FWL	26S	36E	16	Lot D	32.05041	-103.27796	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-9636	23283	12560
EXIT Leg #1	50	FNL	200	FWL	26S	36E	16	Lot D	32.05041	-103.27796	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-9636	23283	12560
BHL Leg #1	50	FNL	200	FWL	26S	36E	16	Lot D	32.05041	-103.27796	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-9636	23283	12560

APD ID: 10400029259 **Submission Date:** 04/10/2018

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Well Type: OIL WELL **Well Work Type:** Drill

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	RUSTLER ANHYDRITE	1054	1876	1876	ANHYDRITE	NONE	No
2	SALADO	-1170	2224	2224	SALT	NONE	No
3	TANSILL	-2152	3206	3206	LIMESTONE	NONE	No
4	CAPITAN REEF	-2567	3621	3621	LIMESTONE	USEABLE WATER	No
5	LAMAR	-3898	4952	4952	LIMESTONE	NONE	No
6	BELL CANYON	-4032	5086	5086	SANDSTONE	NATURAL GAS,OIL	No
7	BRUSHY CANYON	-6051	7105	7105	SANDSTONE	NATURAL GAS,OIL	No
8	BONE SPRING LIME	-7075	8129	8129	LIMESTONE	NONE	No
9	BONE SPRING 1ST	-8577	9631	9631	SANDSTONE	NATURAL GAS,OIL	No
10	BONE SPRING 2ND	-9221	10275	10275	SANDSTONE	NATURAL GAS,OIL	No
11	BONE SPRING 3RD	-9752	10806	10806	LIMESTONE	NATURAL GAS,OIL	No
12	BONE SPRING 3RD	-10468	11522	11522	SANDSTONE	NATURAL GAS,OIL	No
13	WOLFCAMP	-10701	11755	11755	SHALE	NATURAL GAS,OIL	No
14	WOLFCAMP	-11156	12210	12210	SHALE	NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Pressure Rating (PSI): 10M **Rating Depth:** 15000

Equipment: 10M BOPE SYSTEM WILL BE USED AFTER THE SURFACE CASING IS SET. A KELLY COCK WILL BE KEPT IN THE DRILL STRING AT ALL TIMES. A FULL OPENING DRILL PIPE STABBING VALVE WITH PROPER DRILL PIPE CONNECTIONS WILL BE ON THE RIG FLOOR AT ALL TIMES.
Requesting Variance? YES

Variance request: Co-Flex Choke Line, 5M Annular Preventer

Testing Procedure: See attachment

Choke Diagram Attachment:

10M_Choke_Manifold_REV_20190313141742.pdf

BOP Diagram Attachment:

5M_Annular_Preventer_Variance_and_Well_Control_Plan_20190313141808.pdf

5M_BOP_System_20190313141809.pdf

Pressure_Control_Plan_Single_Well_MB4_3String_Big_Hole_BLM_20190313141809.pdf

4_String_MB_Ameredev_Wellhead_Drawing_net_REV_20190313141921.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	2001	0	2001	2924		2001	J-55	68	OTHER - BTC	4.59	0.65	DRY	6.72	DRY	7.86
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	10931	0	10931	2924		10931	HCL-80	40	OTHER - BTC	1.26	1.16	DRY	2.19	DRY	2.15
3	PRODUCTION	8.5	5.5	NEW	API	N	0	23283	0	12560	2924		23283	HCP-110	20	OTHER - BTC	1.64	1.76	DRY	2.61	DRY	2.9

Casing Attachments

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

13.375_54.50_J55_SEAH_20190313142821.pdf

Camellia_Fed_Com_26_36_21_121H___Wellbore_Diagram_and_CDA_20190404092302.pdf

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

9.625_40_SeAH80HC_4100_Collapse_20190313143012.pdf

Camellia_Fed_Com_26_36_21_121H___Wellbore_Diagram_and_CDA_20190404092350.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

5.5_20_P110HP_Eagle_SFH_20190313143217.pdf

Camellia_Fed_Com_26_36_21_121H___Wellbore_Diagram_and_CDA_20190404092409.pdf

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1615	1031	1.76	13.5	1815.28	50	CLASS C	Bentonite, Accelerator, Kolseal, Defoamer, Celloflake
SURFACE	Tail		1615	2001	200	1.34	14.8	268	100	CLASS C	Salt
INTERMEDIATE	Lead	5002	0	4152	684	2.47	11.9	1690.63	25	Class C	Salt, Bentonite, Kolseal, Defoamer, Celloflake, Anti-Settling Expansion Additive
INTERMEDIATE	Tail		4152	5002	200	1.33	14.8	266	25	Class C	Retarder
INTERMEDIATE	Lead	5002	0	9675	1572	2.47	11.9	3882.88	25	CLASS H	Bentonite, Salt, Kolseal, Defoamer, Celloflake, Retarder, Anti-Settling Expansion Additive
INTERMEDIATE	Tail		9675	10931	300	1.24	14.5	371.1	25	CLASS H	Salt, Bentonite, Retarder, Dispersant, Fluid Loss
PRODUCTION	Lead		0	23283	4971	1.34	14.2	6661.58	25	Class H	Salt, Bentonite, Fluid Loss, Dispersant, Retarder, Defoamer

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: All necessary supplies (e.g. bentonite, cedar bark) for fluid control will be on site.

Describe the mud monitoring system utilized: An electronic pit volume totalizer (PVT) will be utilized on the circulating system to monitor pit volume, flow rate, pump pressure, and pump rate.

Circulating Medium Table

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	2001	WATER-BASED MUD	8.4	8.6							
2001	10931	OTHER : Diesel Brine Emulsion	8.5	9.4							
10931	12560	OIL-BASED MUD	10.5	12.5							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

A directional survey, measurement while drilling and a mudlog/geologic lithology log will all be run from surface to TD.

List of open and cased hole logs run in the well:

DS,MWD,MUDLOG

Coring operation description for the well:

No coring will be done on this well.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5000 **Anticipated Surface Pressure:** 2236.8

Anticipated Bottom Hole Temperature(F): 160

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

H2S_Plan_20180410080524.pdf

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 121H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Cam121_DR_20190313144503.pdf

Cam121_LLR_20190313144503.pdf

5M_Annular_Preventer_Variance_and_Well_Control_Plan_20190313144523.pdf

Pressure_Control_Plan_Single_Well_MB4_3String_Big_Hole_BLM_20190313144523.pdf

Other proposed operations facets description:

4-String contingency plan attached

Other proposed operations facets attachment:

CAPITAN_PROTECTION_CONTINGENCY_PLAN_20190313144643.pdf

Other Variance attachment:

R616___CoC_for_hoses_12_18_17_20190313144734.pdf

Requested_Exceptions___3_String_Revised_01312019_20190313144735.pdf

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American Resource Developers LLC

5M Annular Preventer Variance Request and Well Control Procedures

Note: A copy of the Well Control Plan must be available at multiple locations on the rig for review by rig personnel, as well as review by the BLM PET/PE, and a copy must be maintained on the rig floor.

Dual Isolation Design for 5M Annular Exception

Ameredev will utilize 13-5/8" 10M (5M Annular) BOPE System consisting of:

- 13-5/8" 5M Annular
- 13-5/8" 10M Upper Pipe Rams
  - 3-1/2" – 5-1/2" Variable Bore Ram
- 13-5/8" 10M Blind Rams
- 13-5/8" 10M Drilling Spool /w 2 - 4" 10M Outlets Double 10M Isolation Valves
- 13-5/8" 10M Lower Blind Rams
  - 3-1/2" – 5-1/2" Variable Bore Ram

All drilling components and casing associated to exposure > 5000 psi BHP requiring a 10M system will have a double isolation (secondary barrier) below the 5M Annular that would provide a barrier to flow. The mud system will always be primary barrier, it will be maintained by adjusting values based on tourly mud tests and monitoring a PVT System to maintain static wellbore conditions, displacement procedures will be followed and recorded on daily drilling reports during tripping operations. Surge and swab pressure values will be calculated and maintained and static flow check will be monitored at previous casing shoe and verified static well conditions prior to tripping out of hole and again prior to pulling last joint of drill pipe through BOPE. The below table, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

Drill Components	Size	Primary Barrier	Secondary Barrier	Third Barrier
Drillpipe	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
HWDP Drillpipe	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Drill Collars	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Production Casing	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Open Hole	13-5/8	Drilling Fluid	Blind Rams	
All Drilling Components in 10M Environment will have OD that will allow full Operational RATED WORKING PRESSURE for system design. Kill line with minimum 2" ID will be available outside substructure with 10M Check Valve for OOH Kill Operations				

Well Control Procedures

Proper well control procedures are dependent to differentiating well conditions, to cover the basic well control operations there are will be standard drilling ahead, tripping pipe, tripping BHA, running casing, and pipe out of the hole/open hole scenarios that will be defined by procedures below. Initial Shut In Pressure can be taken against the Uppermost BOPE component the 5M Annular, pressure control can be transferred from the lesser 5M Annular to the 10M Upper Pipe Rams if needed. Shut In Pressures may be equal to or less than the Rated Working Pressure but at no time will the pressure on the annular preventer exceed the Rated Working Pressure of the annular. The annular will be tested to 5,000 psi. This will be the Rated Working Pressure of the annular preventer. All scenarios will be written such as shut in will be performed by closing the 10,000 psi Upper Pipe Rams for faster Accumulator pressure recovery to allow safer reaction to controlling wellbore pressure.

Shutting In While Drilling

1. Sound alarm signaling well control event to Rig Crew
2. Space out drill string to allow FOSV installation
3. Shut down pumps
4. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
5. Install open, full open safety valve and close valve, Close Chokes
6. Verify well is shut-in and flow has stopped
7. Notify supervisory personnel
8. Record data (SIDP, SICP, Pit Gain, and Time)
9. Hold pre-job safety meeting and discuss kill procedure

Shutting In While Running Casing

1. Sound alarm signaling well control event to Rig Crew
2. Space out casing to allow circulating swedge installation
3. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install circulating swedge, Close high pressure, low torque valves, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold Pre-job safety meeting and discuss kill procedure

Shutting in while out of hole

1. Sound alarm signaling well control event to Rig Crew
2. Shut-in well: close blind rams and open HCR against Open Chokes and Valves Open to working pressure gauge
3. Close Chokes, Verify well is shut-in and monitor pressures
4. Notify supervisory personnel
5. Record data (SIDP, SICP, Pit Gain, and Time)
6. Hold Pre-job safety meeting and discuss kill procedure

Shutting in prior to pulling BHA through stack

Prior to pulling last joint of drill pipe thru the stack space out and check flow

Shutting in while BHA is in the stack and ram preventer and combo immediately available

1. Sound alarm signaling well control event to Rig Crew
2. Space out BHA with upset just beneath the compatible pipe ram
3. Shut in upper compatible pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install open, full open safety valve and close valve, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure

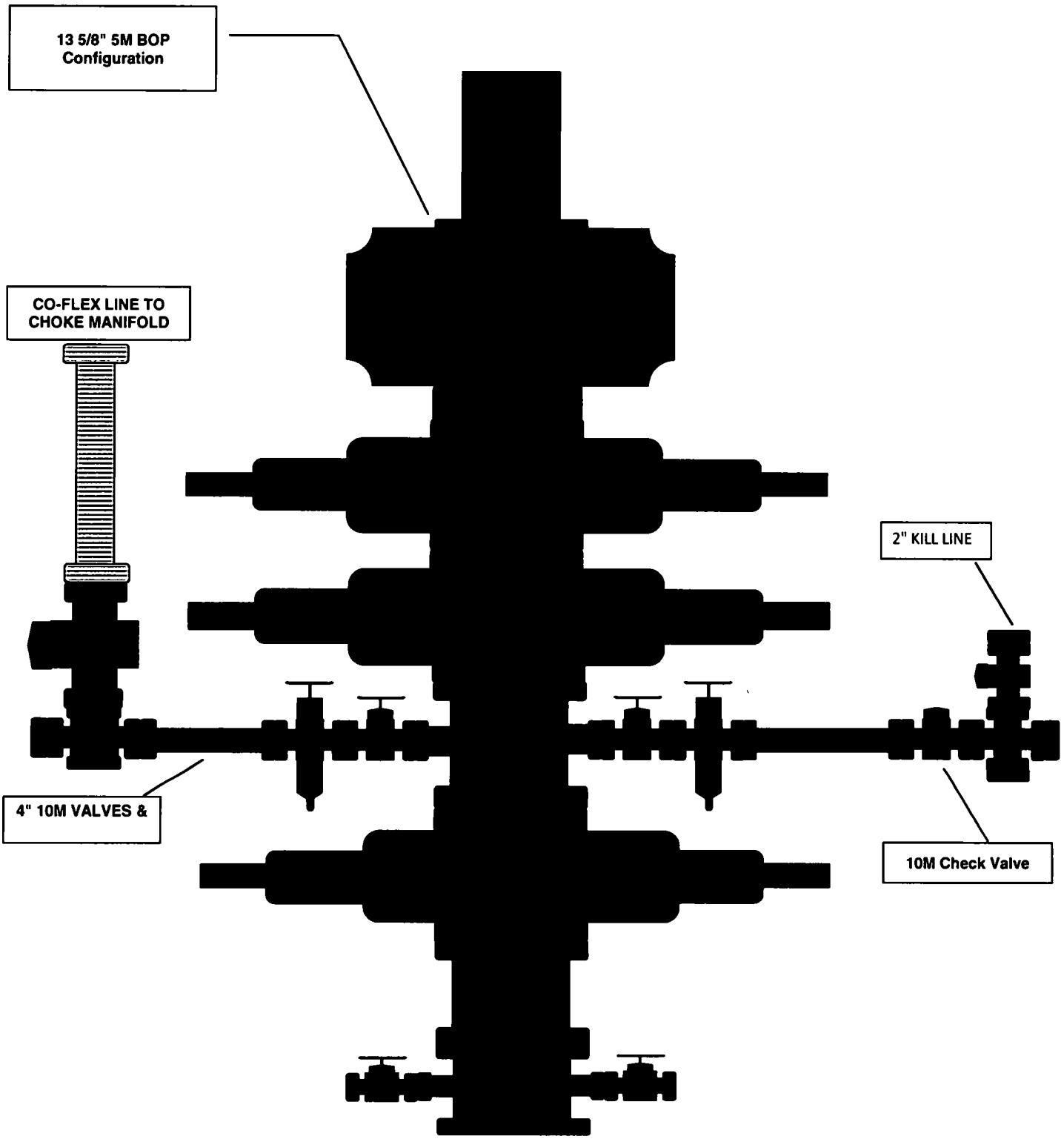
*FOSV will be on rig floor in open position with operating handle for each type of connection utilized and tested to 10,000 psi

Shutting in while BHA is in the stack and no ram preventer or combo immediately available

1. Sound alarm signaling well control event to Rig Crew
2. If possible pick up high enough, to pull string clear and follow "Open Hole" scenario

If not possible to pick up high enough:

3. Stab Crossover, make up one joint/stand of drill pipe, and install open, full open safety valve (Leave Open)
4. Space out drill string with upset just beneath the compatible pipe ram.
5. Shut in upper compatible pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
6. Close FOSV, Close Chokes, Verify well is shut-in and flow has stopped
7. Notify supervisory personnel
8. Record data (SIDP, SICP, Pit Gain, and Time)
9. Hold pre-job safety meeting and discuss kill procedure


13 5/8" 5M BOP
Configuration
CO-FLEX LINE TO
CHOKE MANIFOLD
2" KILL LINE
4" 10M VALVES &
10M Check Valve

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Pressure Control Plan

Pressure Control Equipment

- Following setting of 13-3/8" Surface Casing Ameredev will install 13-5/8 MB4 Multi Bowl Casing Head by welding on a 13-5/8 SOW x 13-5/8" 5M in combination with 13-5/8 5M x 13-5/8 10M B-Sec to Land Intm #1 and a 13-5/8 10M x 13-5/8 10M shouldered to land C-Sec to Land Intm #2 (Installation procedure witnessed and verified by a manufacturer's representative).

- Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Ameredev will install a 5M System Blowout Preventer (BOPE) with a 5M Annular Preventer and related equipment (BOPE). Full testing will be performed utilizing a full isolation test plug and limited to 5,000 psi MOP of MB4 Multi Bowl Casing Head. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 50% of approved working pressure (2,500 psi). Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Setting of 9-5/8" Intermediate will be done by landing a wellhead hanger in the 13-5/8" 5M Bowl, Cementing and setting Well Head Packing seals and testing same. (Installation procedure witnessed and verified by a manufacturer's representative) Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Full testing will be performed utilizing a full isolation test plug to 10,000 psi MOP of MB4 Multi Bowl B-Section. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 100% of approved working pressure (5,000 psi).

- Before drilling >20ft of new formation under the 9-5/8" Casing Shoe a pressure integrity test of the Casing Shoe will be performed to minimum of the MWE anticipated to control formation pressure to the next casing depth.

- Following setting of 5-1/2" Production Casing and adequate WOC time Ameredev will break 10M System Blowout Preventer (BOP) from 10M DOL-2 Casing Head, install annulus casing slips and test same (Installation procedure witnessed and verified by a manufacturer's representative) and install 11" 10M x 5-1/8" 15M Tubing Head (Installation procedure witnessed and verified by a manufacturer's representative). Ameredev will test head to 70% casing design and install Dry Hole cap with needle valve and pressure gauge to monitor well awaiting completion.

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Pressure Control Plan

- Slow pump speeds will be taken daily by each crew and recorded on Daily Drilling Report after mudding up.

- A choke manifold and accumulator with floor and remote operating stations will be functional and in place after installation of BOPE, as well as full functioning mud gas separator.

- Weekly BOPE pit level drills will be conducted by each crew and recorded on Daily Drilling Report.

- BOP will be fully operated when out of hole and will be documented on the daily drilling log.

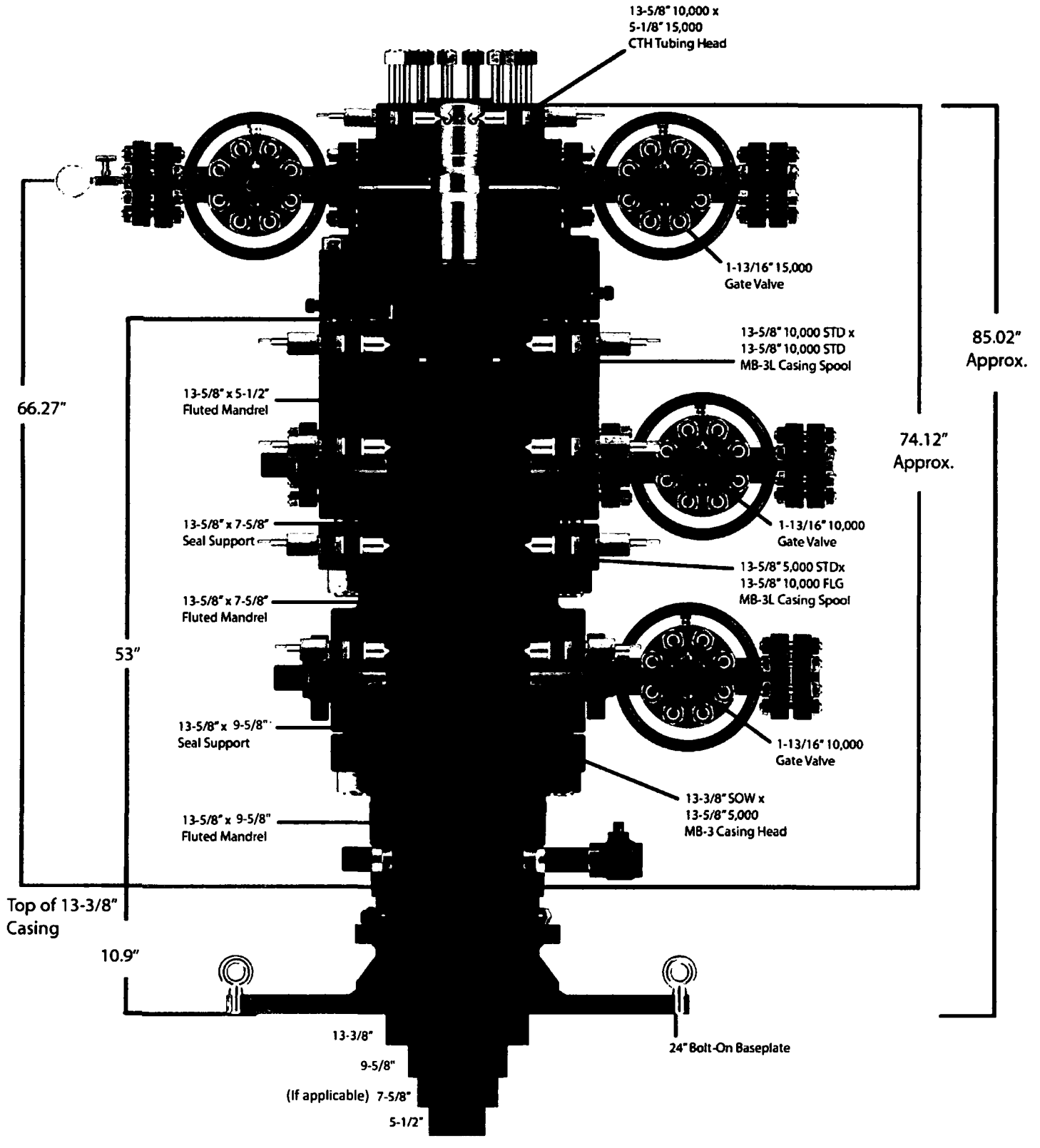
- All B.O.P.s and associated equipment will be tested in accordance with Onshore Order #2

- All B.O.P. testing will be done by an independent service company.

- The B.O.P. will be tested within 21 days of the original test if drilling takes more time than planned.

- Ameredev requests a variance to connect the B.O.P. choke outlet to the choke manifold using a co-flex hose with a 10,000 psi working pressure that has been tested to 15,000psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps. (certifications will be sent to Carlsbad BLM Office prior to install)

- Ameredev requests a variance to install a 5M Annular Preventer on the 10M System to drill the Production Hole below the 9-5/8" Intermediate Section. 5M Annular will be tested to 100% working pressure (5,000 psi). A full well control procedure will be included to isolate well bore.



Quotation

Downing Wellhead Equipment

Oklahoma City,
Oklahoma - USA

Reference Data:

16925 AMEREDEV

Proprietary and Confidential

TITLE:

AMEREDEV

DRAWN			SIZE	DWG. NO.	REV.
CHECKED			A		
APPROVED			Scale:	Weight:	Sheet:

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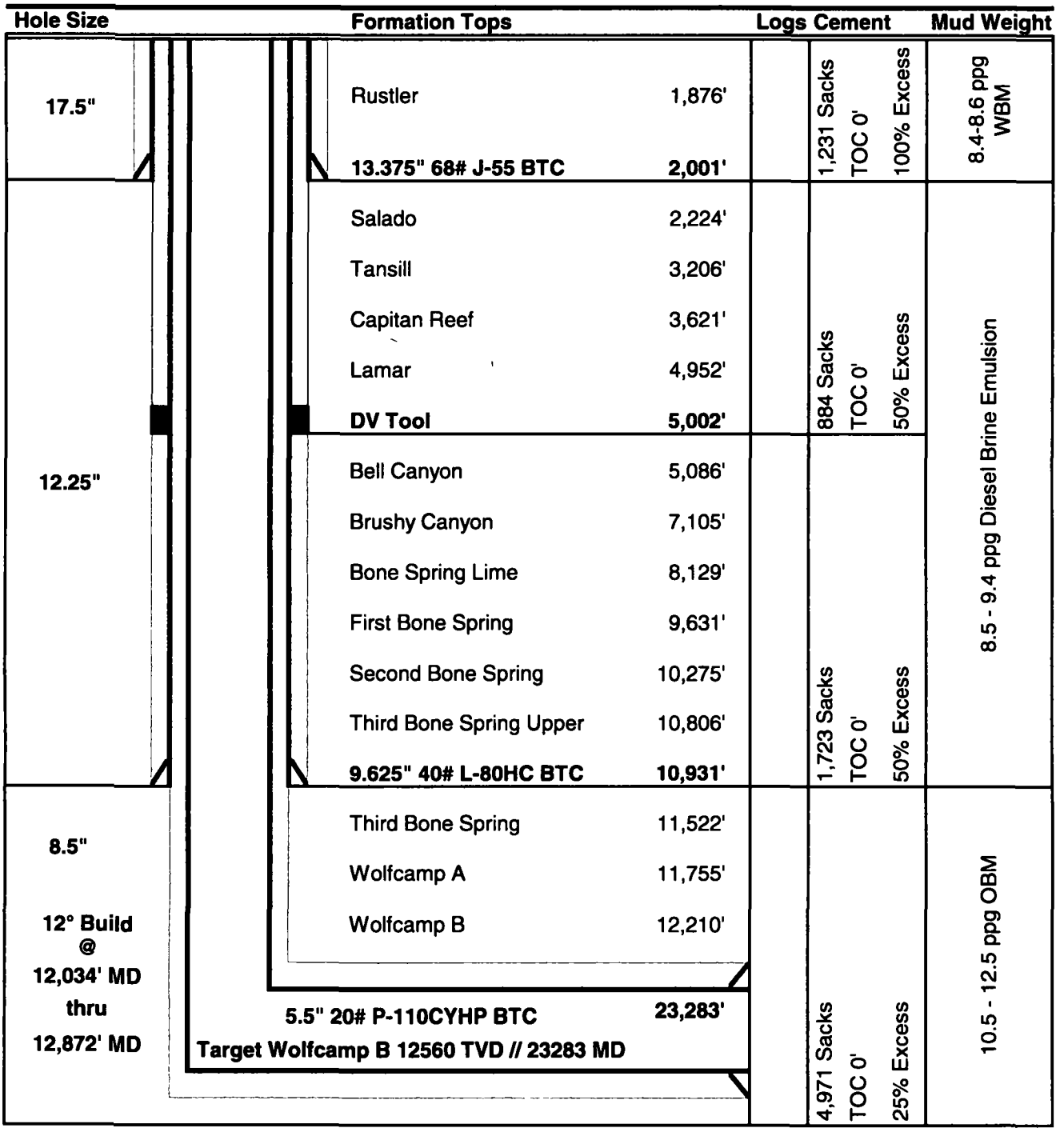
Wellbore Schematic

Well:	Camellia Fed Com 26-36-21 121H	**Co. Well ID:**	40921
SHL:	Sec. 21 26S-36E 283' FSL & 270' FWL	**AFE No.:**	2017-066
BHL:	Sec. 16 26S-36E 50' FNL 200' FWL	**API No.:**	xxxxxxxxxxx
	Lea, NM	**GL:**	2,924'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Wolfcamp B
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	12,560'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	23,283'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB:** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com



Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	2,001'	13.375	68	J-55	BTC
Intermediate	12.25	10,931'	9.625	40	HCL-80	BTC
Prod Segment A	8.5	12,034'	5.5	20	CYHP-110	BTC
Prod Segment B	8.5	23,283'	5.5	20	CYHP-110	BTC

Check Surface Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
14.375	1,069	915	4,100	3,450
Safety Factors				
1.56	7.86	6.72	4.59	0.65
Check Intermediate Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
7.625	940	558	6700	9460
Safety Factors				
2.31	2.15	2.19	1.26	1.16
Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	2.90	2.61	1.64	1.76
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	69.20	62.26	1.57	1.76

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Wellbore Schematic

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	Lea, NM	**GL:**	2,924'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Wolfcamp B
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	12,560'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	23,283'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB:** 27'
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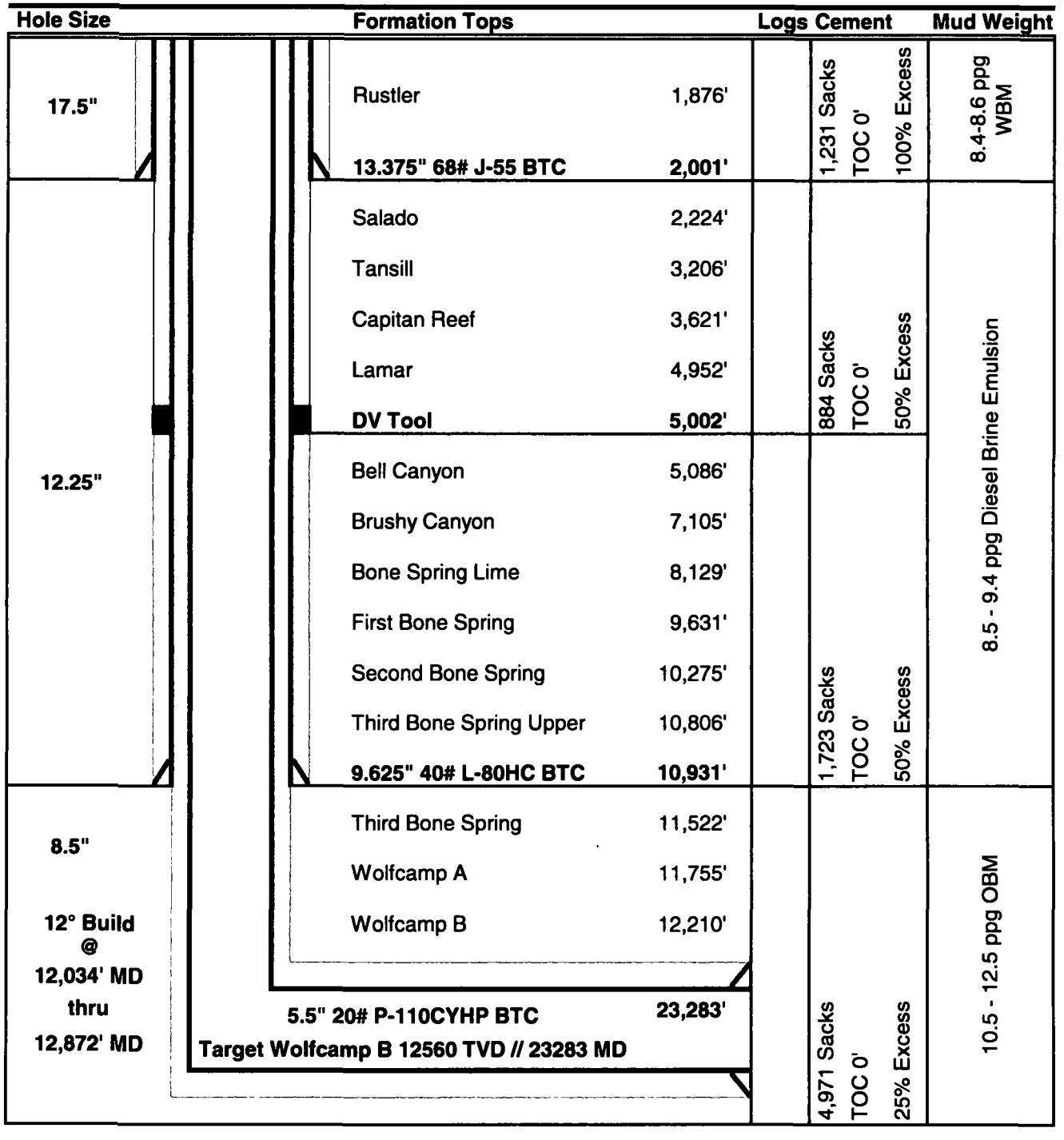

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Safety Factors				
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Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
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Safety Factors				
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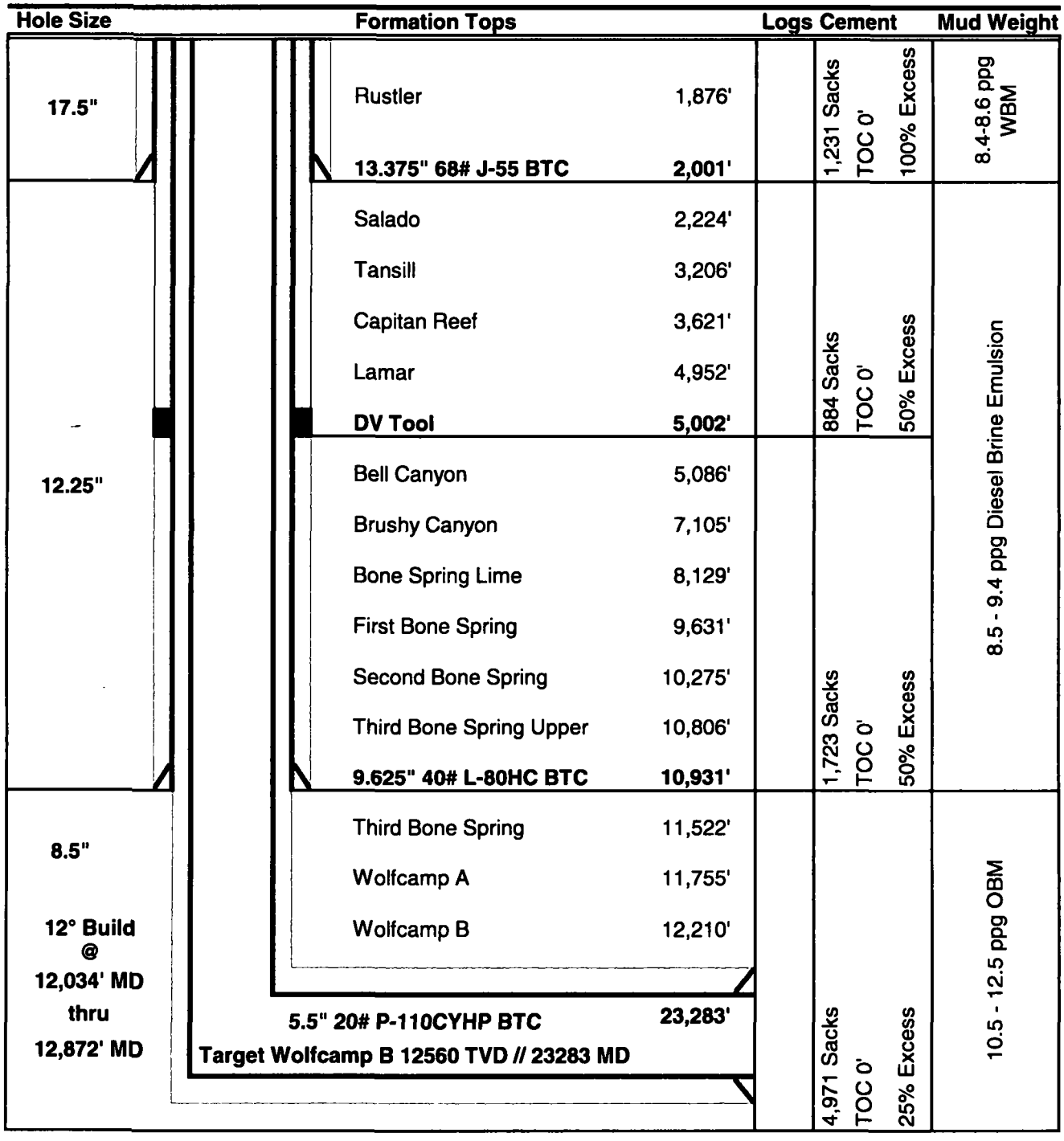

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Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	69.20	62.26	1.57	1.76

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H_2S Drilling Operation Plan

1. **All Company and Contract personnel admitted on location must be trained by a qualified H_2S safety instructor to the following:**
   a. Characteristics of H_2S
   b. Physical effects and hazards
   c. Principal and operation of H_2s detectors, warning system and briefing areas
   d. Evacuation procedure, routes and first aid
   e. Proper use of safety equipment and life support systems
   f. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

2. **Briefing Area:**
   a. Two perpendicular areas will be designated by signs and readily accessible.
   b. Upon location entry there will be a designated area to establish all safety compliance criteria (1.) has been met.

3. **H_2S Detection and Alarm Systems:**
   a. H_2S sensors/detectors shall be located on the drilling rig floor, in the base of the sub structure/cellar area, and on the mud pits in the shale shaker area. Additional H_2S detectors may be placed as deemed necessary. All detectors will be set to initiate visual alarm at 10 ppm and visual with audible at 14 ppm and all equipment will be calibrated every 30 days or as needed.
   b. An audio alarm will be installed on the derrick floor and in the top doghouse.

4. **Protective Equipment for Essential Personnel:**
   a. **Breathing Apparatus:**
      i. Rescue Packs (SCBA) - 1 Unit shall be placed at each briefing area.
      ii. Two (SCBA) Units will be stored in safety trailer on location.
      iii. Work/Escape packs - 1 Unit will be available on rig floor in doghouse for emergency evacuation for driller.
   b. **Auxiliary Rescue Equipment:**
      i. Stretcher
      ii. 2 - OSHA full body harnesses
      iii. 100 ft. 5/8" OSHA approved rope
      iv. 1 - 20# class ABC fire extinguisher

5. **Windsock and/or Wind Streamers:**
   a. Windsock at mud pit area should be high enough to be visible.
   b. Windsock on the rig floor should be high enough to be visible.

6. **Communication:**
   a. While working under mask scripting boards will be used for communication where applicable.
   b. Hand signals will be used when script boards are not applicable.

c. Two way radios will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at Drilling Foreman's Office.

7. **Drill Stem Testing:** - No Planned DST at this time.

8. **Mud program:**
   a. If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.

9. **Metallurgy:**

   a. All drill strings, casing, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H_2S service.
   b. Drilling Contractor supervisor will be required to be familiar with the effect H_2S has on tubular goods and other mechanical equipment provided through contractor.

AMEREDEV

H_2S Contingency Plan

Emergency Procedures

In the event of a release of H_2S, the first responder(s) must:

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H_2S monitors and air packs in order to control the release.
- Use the "buddy system" to ensure no injuries occur during the response.
- Take precautions to avoid personal injury during this operation.
- Contact Operator and/or local officials the aid in operation. See list of phone numbers attached.
- Have received training in the:
    - Detection of H_2S and
    - Measures for protection against the gas,
    - Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air=1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air=1	2 ppm	N/A	1000 ppm

Contacting Authorities

Ameredev Operating LLC personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including direction to site. The following call list of essential and potential responders has been prepared for use during a release. Ameredev Operating LLC's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER)

AMEREDEV

H_2S Contingency Plan

Ameredev Operating LLC – Emergency Phone 737-300-4799			
Key Personnel:			
Name	Title	Office	Mobile
Floyd Hammond	Chief Operating officer	737-300-4724	512-783-6810
Zachary Boyd	Operations Superintendent	737-300-4725	432-385-6996
Blake Estrada	Construction Foreman		432-385-5831

Artesia	
Ambulance	911
State Police	575-746-2703
City Police	575-746-2703
Sheriff's Office	575-746-9888
Fire Department	575-746-2701
Local Emergency Planning Committee	575-746-2122
New Mexico Oil Conservation Division	575-748-1283
Carlsbad	
Ambulance	911
State Police	575-885-3137
City Police	575-885-2111
Sheriff's Office	575-887-7551
Fire Department	575-887-3798
Local Emergency Planning Committee	575-887-6544
US Bureau of Land Management	575-887-6544
Santa Fe	
New Mexico Emergency Response Commission (Santa Fe)	505-476-9600
New Mexico Emergency Response Commission (Santa Fe) 24 Hrs	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635
National	
National Emergency Response Center (Washington, D.C.)	800-424-8802
Medical	
Flight for Life - 4000 24th St.; Lubbock, TX	806-743-9911
Aerocare - R3, Box 49F; Lubbock, TX	806-747-8923
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM	505-842-4433
.'SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM	505-842-4949

AMEREDEV

Ameredev Operating, LLC.

CAM/AZ
CAM/AZ #1N
Camellia 121H

Wellbore #1

Plan: Design #1

Standard Planning Report

16 January, 2019

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	CAM/AZ		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	CAM/AZ #1N				
Site Position:		**Northing:**	373,448.30 usft	**Latitude:**	32° 1' 20.266 N
From:	Lat/Long	**Easting:**	868,493.74 usft	**Longitude:**	103° 16' 39.795 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.56 °

Well	Camellia 121H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	373,448.30 usft	**Latitude:**	32° 1' 20.266 N
	+E/-W	0.0 usft	**Easting:**	868,493.74 usft	**Longitude:**	103° 16' 39.795 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,924.0 usft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	1/11/2019	6.63	59.90	47,691.06803742

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	359.02	

Plan Survey Tool Program **Date** 1/16/2019

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.0	23,283.4	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
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Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,300.0	6.00	180.00	2,299.5	-15.7	0.0	2.00	2.00	0.00	180.00	
6,724.8	6.00	180.00	6,700.0	-478.2	0.0	0.00	0.00	0.00	0.00	
7,024.8	0.00	0.00	6,999.5	-493.9	0.0	2.00	-2.00	0.00	180.00	
8,525.3	0.00	0.00	8,500.0	-493.9	0.0	0.00	0.00	0.00	0.00	
8,825.3	6.00	180.00	8,799.5	-509.6	0.0	2.00	2.00	0.00	180.00	
10,133.0	6.00	180.00	10,100.0	-646.3	0.0	0.00	0.00	0.00	0.00	
10,433.0	0.00	0.00	10,399.5	-662.0	0.0	2.00	-2.00	0.00	180.00	
12,033.6	0.00	0.00	12,000.0	-662.0	0.0	0.00	0.00	0.00	0.00	
12,094.7	7.29	248.11	12,061.0	-663.4	-3.6	11.93	11.93	0.00	248.11	
12,871.5	90.00	359.42	12,560.0	-184.1	-68.0	11.93	10.65	14.33	111.14	Cam121 FTP
23,283.4	90.00	359.42	12,560.0	10,227.1	-174.3	0.00	0.00	0.00	0.00	Cam121 BHL

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	2.00	180.00	2,100.0	-1.7	0.0	-1.7	2.00	2.00	0.00
2,200.0	4.00	180.00	2,199.8	-7.0	0.0	-7.0	2.00	2.00	0.00
2,300.0	6.00	180.00	2,299.5	-15.7	0.0	-15.7	2.00	2.00	0.00
2,400.0	6.00	180.00	2,398.9	-26.1	0.0	-26.1	0.00	0.00	0.00
2,500.0	6.00	180.00	2,498.4	-36.6	0.0	-36.6	0.00	0.00	0.00
2,600.0	6.00	180.00	2,597.8	-47.1	0.0	-47.0	0.00	0.00	0.00
2,700.0	6.00	180.00	2,697.3	-57.5	0.0	-57.5	0.00	0.00	0.00
2,800.0	6.00	180.00	2,796.7	-68.0	0.0	-67.9	0.00	0.00	0.00
2,900.0	6.00	180.00	2,896.2	-78.4	0.0	-78.4	0.00	0.00	0.00
3,000.0	6.00	180.00	2,995.6	-88.9	0.0	-88.9	0.00	0.00	0.00
3,100.0	6.00	180.00	3,095.1	-99.3	0.0	-99.3	0.00	0.00	0.00
3,200.0	6.00	180.00	3,194.5	-109.8	0.0	-109.8	0.00	0.00	0.00
3,300.0	6.00	180.00	3,294.0	-120.2	0.0	-120.2	0.00	0.00	0.00
3,400.0	6.00	180.00	3,393.4	-130.7	0.0	-130.7	0.00	0.00	0.00
3,500.0	6.00	180.00	3,492.9	-141.1	0.0	-141.1	0.00	0.00	0.00
3,600.0	6.00	180.00	3,592.3	-151.6	0.0	-151.6	0.00	0.00	0.00
3,700.0	6.00	180.00	3,691.8	-162.0	0.0	-162.0	0.00	0.00	0.00
3,800.0	6.00	180.00	3,791.2	-172.5	0.0	-172.5	0.00	0.00	0.00
3,900.0	6.00	180.00	3,890.7	-182.9	0.0	-182.9	0.00	0.00	0.00
4,000.0	6.00	180.00	3,990.1	-193.4	0.0	-193.4	0.00	0.00	0.00
4,100.0	6.00	180.00	4,089.6	-203.8	0.0	-203.8	0.00	0.00	0.00
4,200.0	6.00	180.00	4,189.0	-214.3	0.0	-214.3	0.00	0.00	0.00
4,300.0	6.00	180.00	4,288.5	-224.8	0.0	-224.7	0.00	0.00	0.00
4,400.0	6.00	180.00	4,387.9	-235.2	0.0	-235.2	0.00	0.00	0.00
4,500.0	6.00	180.00	4,487.4	-245.7	0.0	-245.6	0.00	0.00	0.00
4,600.0	6.00	180.00	4,586.9	-256.1	0.0	-256.1	0.00	0.00	0.00
4,700.0	6.00	180.00	4,686.3	-266.6	0.0	-266.5	0.00	0.00	0.00
4,800.0	6.00	180.00	4,785.8	-277.0	0.0	-277.0	0.00	0.00	0.00
4,900.0	6.00	180.00	4,885.2	-287.5	0.0	-287.4	0.00	0.00	0.00
5,000.0	6.00	180.00	4,984.7	-297.9	0.0	-297.9	0.00	0.00	0.00
5,100.0	6.00	180.00	5,084.1	-308.4	0.0	-308.3	0.00	0.00	0.00
5,200.0	6.00	180.00	5,183.6	-318.8	0.0	-318.8	0.00	0.00	0.00
5,300.0	6.00	180.00	5,283.0	-329.3	0.0	-329.2	0.00	0.00	0.00

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Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	6.00	180.00	5,382.5	-339.7	0.0	-339.7	0.00	0.00	0.00
5,500.0	6.00	180.00	5,481.9	-350.2	0.0	-350.1	0.00	0.00	0.00
5,600.0	6.00	180.00	5,581.4	-360.6	0.0	-360.6	0.00	0.00	0.00
5,700.0	6.00	180.00	5,680.8	-371.1	0.0	-371.0	0.00	0.00	0.00
5,800.0	6.00	180.00	5,780.3	-381.5	0.0	-381.5	0.00	0.00	0.00
5,900.0	6.00	180.00	5,879.7	-392.0	0.0	-391.9	0.00	0.00	0.00
6,000.0	6.00	180.00	5,979.2	-402.4	0.0	-402.4	0.00	0.00	0.00
6,100.0	6.00	180.00	6,078.6	-412.9	0.0	-412.8	0.00	0.00	0.00
6,200.0	6.00	180.00	6,178.1	-423.4	0.0	-423.3	0.00	0.00	0.00
6,300.0	6.00	180.00	6,277.5	-433.8	0.0	-433.7	0.00	0.00	0.00
6,400.0	6.00	180.00	6,377.0	-444.3	0.0	-444.2	0.00	0.00	0.00
6,500.0	6.00	180.00	6,476.4	-454.7	0.0	-454.6	0.00	0.00	0.00
6,600.0	6.00	180.00	6,575.9	-465.2	0.0	-465.1	0.00	0.00	0.00
6,700.0	6.00	180.00	6,675.3	-475.6	0.0	-475.5	0.00	0.00	0.00
6,724.8	6.00	180.00	6,700.0	-478.2	0.0	-478.1	0.00	0.00	0.00
6,800.0	4.50	180.00	6,774.9	-485.1	0.0	-485.0	2.00	-2.00	0.00
6,900.0	2.50	180.00	6,874.7	-491.2	0.0	-491.1	2.00	-2.00	0.00
7,000.0	0.50	180.00	6,974.7	-493.8	0.0	-493.7	2.00	-2.00	0.00
7,024.8	0.00	0.00	6,999.5	-493.9	0.0	-493.8	2.00	-2.00	0.00
7,100.0	0.00	0.00	7,074.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,174.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,300.0	0.00	0.00	7,274.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,374.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,500.0	0.00	0.00	7,474.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,600.0	0.00	0.00	7,574.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,700.0	0.00	0.00	7,674.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,800.0	0.00	0.00	7,774.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,900.0	0.00	0.00	7,874.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,000.0	0.00	0.00	7,974.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,100.0	0.00	0.00	8,074.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,200.0	0.00	0.00	8,174.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,300.0	0.00	0.00	8,274.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,400.0	0.00	0.00	8,374.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,500.0	0.00	0.00	8,474.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,525.3	0.00	0.00	8,500.0	-493.9	0.0	-493.8	0.00	0.00	0.00
8,600.0	1.49	180.00	8,574.7	-494.9	0.0	-494.8	2.00	2.00	0.00
8,700.0	3.49	180.00	8,674.6	-499.2	0.0	-499.2	2.00	2.00	0.00
8,800.0	5.49	180.00	8,774.2	-507.1	0.0	-507.0	2.00	2.00	0.00
8,825.3	6.00	180.00	8,799.5	-509.6	0.0	-509.5	2.00	2.00	0.00
8,900.0	6.00	180.00	8,873.7	-517.4	0.0	-517.3	0.00	0.00	0.00
9,000.0	6.00	180.00	8,973.2	-527.9	0.0	-527.8	0.00	0.00	0.00
9,100.0	6.00	180.00	9,072.6	-538.3	0.0	-538.2	0.00	0.00	0.00
9,200.0	6.00	180.00	9,172.1	-548.8	0.0	-548.7	0.00	0.00	0.00
9,300.0	6.00	180.00	9,271.5	-559.2	0.0	-559.1	0.00	0.00	0.00
9,400.0	6.00	180.00	9,371.0	-569.7	0.0	-569.6	0.00	0.00	0.00
9,500.0	6.00	180.00	9,470.4	-580.1	0.0	-580.0	0.00	0.00	0.00
9,600.0	6.00	180.00	9,569.9	-590.6	0.0	-590.5	0.00	0.00	0.00
9,700.0	6.00	180.00	9,669.3	-601.0	0.0	-600.9	0.00	0.00	0.00
9,800.0	6.00	180.00	9,768.8	-611.5	0.0	-611.4	0.00	0.00	0.00
9,900.0	6.00	180.00	9,868.2	-621.9	0.0	-621.8	0.00	0.00	0.00
10,000.0	6.00	180.00	9,967.7	-632.4	0.0	-632.3	0.00	0.00	0.00
10,100.0	6.00	180.00	10,067.1	-642.8	0.0	-642.7	0.00	0.00	0.00
10,133.0	6.00	180.00	10,100.0	-646.3	0.0	-646.2	0.00	0.00	0.00
10,200.0	4.66	180.00	10,166.7	-652.5	0.0	-652.4	2.00	-2.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,300.0	2.66	180.00	10,266.5	-658.9	0.0	-658.8	2.00	-2.00	0.00
10,400.0	0.66	180.00	10,366.4	-661.8	0.0	-661.7	2.00	-2.00	0.00
Sec 28									
10,433.0	0.00	0.00	10,399.5	-662.0	0.0	-661.9	2.00	-2.00	0.00
10,500.0	0.00	0.00	10,466.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,600.0	0.00	0.00	10,566.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,700.0	0.00	0.00	10,666.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,800.0	0.00	0.00	10,766.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,900.0	0.00	0.00	10,866.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,000.0	0.00	0.00	10,966.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,100.0	0.00	0.00	11,066.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,200.0	0.00	0.00	11,166.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,300.0	0.00	0.00	11,266.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,400.0	0.00	0.00	11,366.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,500.0	0.00	0.00	11,466.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,600.0	0.00	0.00	11,566.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,700.0	0.00	0.00	11,666.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,800.0	0.00	0.00	11,766.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,800.6	0.00	0.00	11,767.0	-662.0	0.0	-661.9	0.00	0.00	0.00
Sec 21									
11,900.0	0.00	0.00	11,866.4	-662.0	0.0	-661.9	0.00	0.00	0.00
12,000.0	0.00	0.00	11,966.4	-662.0	0.0	-661.9	0.00	0.00	0.00
12,033.6	0.00	0.00	12,000.0	-662.0	0.0	-661.9	0.00	0.00	0.00
12,094.7	7.29	248.11	12,061.0	-663.4	-3.6	-663.3	11.93	11.93	0.00
12,100.0	7.09	252.88	12,066.2	-663.7	-4.2	-663.5	11.93	-3.84	90.26
12,200.0	12.00	325.31	12,165.1	-656.9	-16.1	-656.5	11.93	4.91	72.43
12,300.0	22.82	342.96	12,260.4	-629.7	-27.7	-629.1	11.93	10.82	17.65
12,400.0	34.36	349.38	12,348.1	-583.3	-38.6	-582.5	11.93	11.54	6.41
12,500.0	46.08	352.83	12,424.3	-519.5	-48.4	-518.7	11.93	11.72	3.45
12,600.0	57.87	355.12	12,485.8	-441.3	-56.5	-440.3	11.93	11.79	2.30
12,700.0	69.69	356.89	12,529.9	-352.0	-62.7	-350.9	11.93	11.82	1.76
12,800.0	81.53	358.40	12,554.7	-255.4	-66.6	-254.2	11.93	11.84	1.51
12,871.5	90.00	359.42	12,560.0	-184.1	-68.0	-183.0	11.93	11.84	1.42
Cam121 FTP									
12,900.0	90.00	359.42	12,560.0	-155.7	-68.3	-154.5	0.00	0.00	0.00
13,000.0	90.00	359.42	12,560.0	-55.7	-69.3	-54.5	0.00	0.00	0.00
13,100.0	90.00	359.42	12,560.0	44.3	-70.3	45.5	0.00	0.00	0.00
13,200.0	90.00	359.42	12,560.0	144.3	-71.3	145.5	0.00	0.00	0.00
13,300.0	90.00	359.42	12,560.0	244.3	-72.3	245.5	0.00	0.00	0.00
13,400.0	90.00	359.42	12,560.0	344.3	-73.4	345.5	0.00	0.00	0.00
13,500.0	90.00	359.42	12,560.0	444.3	-74.4	445.5	0.00	0.00	0.00
13,600.0	90.00	359.42	12,560.0	544.3	-75.4	545.5	0.00	0.00	0.00
13,700.0	90.00	359.42	12,560.0	644.3	-76.4	645.5	0.00	0.00	0.00
13,800.0	90.00	359.42	12,560.0	744.3	-77.5	745.5	0.00	0.00	0.00
13,900.0	90.00	359.42	12,560.0	844.3	-78.5	845.5	0.00	0.00	0.00
14,000.0	90.00	359.42	12,560.0	944.3	-79.5	945.5	0.00	0.00	0.00
14,100.0	90.00	359.42	12,560.0	1,044.3	-80.5	1,045.5	0.00	0.00	0.00
14,200.0	90.00	359.42	12,560.0	1,144.3	-81.5	1,145.5	0.00	0.00	0.00
14,300.0	90.00	359.42	12,560.0	1,244.3	-82.6	1,245.5	0.00	0.00	0.00
14,400.0	90.00	359.42	12,560.0	1,344.2	-83.6	1,345.5	0.00	0.00	0.00
14,500.0	90.00	359.42	12,560.0	1,444.2	-84.6	1,445.5	0.00	0.00	0.00
14,600.0	90.00	359.42	12,560.0	1,544.2	-85.6	1,545.5	0.00	0.00	0.00
14,700.0	90.00	359.42	12,560.0	1,644.2	-86.6	1,645.5	0.00	0.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,800.0	90.00	359.42	12,560.0	1,744.2	-87.7	1,745.5	0.00	0.00	0.00
14,900.0	90.00	359.42	12,560.0	1,844.2	-88.7	1,845.5	0.00	0.00	0.00
15,000.0	90.00	359.42	12,560.0	1,944.2	-89.7	1,945.5	0.00	0.00	0.00
15,100.0	90.00	359.42	12,560.0	2,044.2	-90.7	2,045.5	0.00	0.00	0.00
15,200.0	90.00	359.42	12,560.0	2,144.2	-91.7	2,145.5	0.00	0.00	0.00
15,300.0	90.00	359.42	12,560.0	2,244.2	-92.8	2,245.5	0.00	0.00	0.00
15,400.0	90.00	359.42	12,560.0	2,344.2	-93.8	2,345.5	0.00	0.00	0.00
15,500.0	90.00	359.42	12,560.0	2,444.2	-94.8	2,445.5	0.00	0.00	0.00
15,600.0	90.00	359.42	12,560.0	2,544.2	-95.8	2,545.5	0.00	0.00	0.00
15,700.0	90.00	359.42	12,560.0	2,644.2	-96.9	2,645.4	0.00	0.00	0.00
15,800.0	90.00	359.42	12,560.0	2,744.2	-97.9	2,745.4	0.00	0.00	0.00
15,900.0	90.00	359.42	12,560.0	2,844.2	-98.9	2,845.4	0.00	0.00	0.00
16,000.0	90.00	359.42	12,560.0	2,944.2	-99.9	2,945.4	0.00	0.00	0.00
16,100.0	90.00	359.42	12,560.0	3,044.2	-100.9	3,045.4	0.00	0.00	0.00
16,200.0	90.00	359.42	12,560.0	3,144.2	-102.0	3,145.4	0.00	0.00	0.00
16,300.0	90.00	359.42	12,560.0	3,244.2	-103.0	3,245.4	0.00	0.00	0.00
16,400.0	90.00	359.42	12,560.0	3,344.1	-104.0	3,345.4	0.00	0.00	0.00
16,500.0	90.00	359.42	12,560.0	3,444.1	-105.0	3,445.4	0.00	0.00	0.00
16,600.0	90.00	359.42	12,560.0	3,544.1	-106.0	3,545.4	0.00	0.00	0.00
16,700.0	90.00	359.42	12,560.0	3,644.1	-107.1	3,645.4	0.00	0.00	0.00
16,800.0	90.00	359.42	12,560.0	3,744.1	-108.1	3,745.4	0.00	0.00	0.00
16,900.0	90.00	359.42	12,560.0	3,844.1	-109.1	3,845.4	0.00	0.00	0.00
17,000.0	90.00	359.42	12,560.0	3,944.1	-110.1	3,945.4	0.00	0.00	0.00
17,100.0	90.00	359.42	12,560.0	4,044.1	-111.1	4,045.4	0.00	0.00	0.00
17,200.0	90.00	359.42	12,560.0	4,144.1	-112.2	4,145.4	0.00	0.00	0.00
17,300.0	90.00	359.42	12,560.0	4,244.1	-113.2	4,245.4	0.00	0.00	0.00
17,400.0	90.00	359.42	12,560.0	4,344.1	-114.2	4,345.4	0.00	0.00	0.00
17,500.0	90.00	359.42	12,560.0	4,444.1	-115.2	4,445.4	0.00	0.00	0.00
17,600.0	90.00	359.42	12,560.0	4,544.1	-116.2	4,545.4	0.00	0.00	0.00
17,700.0	90.00	359.42	12,560.0	4,644.1	-117.3	4,645.4	0.00	0.00	0.00
17,800.0	90.00	359.42	12,560.0	4,744.1	-118.3	4,745.4	0.00	0.00	0.00
17,900.0	90.00	359.42	12,560.0	4,844.1	-119.3	4,845.4	0.00	0.00	0.00
18,000.0	90.00	359.42	12,560.0	4,944.1	-120.3	4,945.4	0.00	0.00	0.00
18,053.2	90.00	359.42	12,560.0	4,997.2	-120.9	4,998.5	0.00	0.00	0.00
Sec 16									
18,100.0	90.00	359.42	12,560.0	5,044.1	-121.4	5,045.4	0.00	0.00	0.00
18,200.0	90.00	359.42	12,560.0	5,144.1	-122.4	5,145.4	0.00	0.00	0.00
18,300.0	90.00	359.42	12,560.0	5,244.0	-123.4	5,245.4	0.00	0.00	0.00
18,400.0	90.00	359.42	12,560.0	5,344.0	-124.4	5,345.4	0.00	0.00	0.00
18,500.0	90.00	359.42	12,560.0	5,444.0	-125.4	5,445.4	0.00	0.00	0.00
18,600.0	90.00	359.42	12,560.0	5,544.0	-126.5	5,545.4	0.00	0.00	0.00
18,700.0	90.00	359.42	12,560.0	5,644.0	-127.5	5,645.4	0.00	0.00	0.00
18,800.0	90.00	359.42	12,560.0	5,744.0	-128.5	5,745.4	0.00	0.00	0.00
18,900.0	90.00	359.42	12,560.0	5,844.0	-129.5	5,845.4	0.00	0.00	0.00
19,000.0	90.00	359.42	12,560.0	5,944.0	-130.5	5,945.4	0.00	0.00	0.00
19,100.0	90.00	359.42	12,560.0	6,044.0	-131.6	6,045.4	0.00	0.00	0.00
19,200.0	90.00	359.42	12,560.0	6,144.0	-132.6	6,145.4	0.00	0.00	0.00
19,300.0	90.00	359.42	12,560.0	6,244.0	-133.6	6,245.4	0.00	0.00	0.00
19,400.0	90.00	359.42	12,560.0	6,344.0	-134.6	6,345.4	0.00	0.00	0.00
19,500.0	90.00	359.42	12,560.0	6,444.0	-135.6	6,445.4	0.00	0.00	0.00
19,600.0	90.00	359.42	12,560.0	6,544.0	-136.7	6,545.4	0.00	0.00	0.00
19,700.0	90.00	359.42	12,560.0	6,644.0	-137.7	6,645.4	0.00	0.00	0.00
19,800.0	90.00	359.42	12,560.0	6,744.0	-138.7	6,745.4	0.00	0.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,900.0	90.00	359.42	12,560.0	6,844.0	-139.7	6,845.3	0.00	0.00	0.00
20,000.0	90.00	359.42	12,560.0	6,944.0	-140.7	6,945.3	0.00	0.00	0.00
20,100.0	90.00	359.42	12,560.0	7,044.0	-141.8	7,045.3	0.00	0.00	0.00
20,200.0	90.00	359.42	12,560.0	7,143.9	-142.8	7,145.3	0.00	0.00	0.00
20,300.0	90.00	359.42	12,560.0	7,243.9	-143.8	7,245.3	0.00	0.00	0.00
20,400.0	90.00	359.42	12,560.0	7,343.9	-144.8	7,345.3	0.00	0.00	0.00
20,500.0	90.00	359.42	12,560.0	7,443.9	-145.9	7,445.3	0.00	0.00	0.00
20,600.0	90.00	359.42	12,560.0	7,543.9	-146.9	7,545.3	0.00	0.00	0.00
20,700.0	90.00	359.42	12,560.0	7,643.9	-147.9	7,645.3	0.00	0.00	0.00
20,800.0	90.00	359.42	12,560.0	7,743.9	-148.9	7,745.3	0.00	0.00	0.00
20,900.0	90.00	359.42	12,560.0	7,843.9	-149.9	7,845.3	0.00	0.00	0.00
21,000.0	90.00	359.42	12,560.0	7,943.9	-151.0	7,945.3	0.00	0.00	0.00
21,100.0	90.00	359.42	12,560.0	8,043.9	-152.0	8,045.3	0.00	0.00	0.00
21,200.0	90.00	359.42	12,560.0	8,143.9	-153.0	8,145.3	0.00	0.00	0.00
21,300.0	90.00	359.42	12,560.0	8,243.9	-154.0	8,245.3	0.00	0.00	0.00
21,400.0	90.00	359.42	12,560.0	8,343.9	-155.0	8,345.3	0.00	0.00	0.00
21,500.0	90.00	359.42	12,560.0	8,443.9	-156.1	8,445.3	0.00	0.00	0.00
21,600.0	90.00	359.42	12,560.0	8,543.9	-157.1	8,545.3	0.00	0.00	0.00
21,700.0	90.00	359.42	12,560.0	8,643.9	-158.1	8,645.3	0.00	0.00	0.00
21,800.0	90.00	359.42	12,560.0	8,743.9	-159.1	8,745.3	0.00	0.00	0.00
21,900.0	90.00	359.42	12,560.0	8,843.9	-160.1	8,845.3	0.00	0.00	0.00
22,000.0	90.00	359.42	12,560.0	8,943.9	-161.2	8,945.3	0.00	0.00	0.00
22,100.0	90.00	359.42	12,560.0	9,043.8	-162.2	9,045.3	0.00	0.00	0.00
22,200.0	90.00	359.42	12,560.0	9,143.8	-163.2	9,145.3	0.00	0.00	0.00
22,300.0	90.00	359.42	12,560.0	9,243.8	-164.2	9,245.3	0.00	0.00	0.00
22,400.0	90.00	359.42	12,560.0	9,343.8	-165.3	9,345.3	0.00	0.00	0.00
22,500.0	90.00	359.42	12,560.0	9,443.8	-166.3	9,445.3	0.00	0.00	0.00
22,600.0	90.00	359.42	12,560.0	9,543.8	-167.3	9,545.3	0.00	0.00	0.00
22,700.0	90.00	359.42	12,560.0	9,643.8	-168.3	9,645.3	0.00	0.00	0.00
22,800.0	90.00	359.42	12,560.0	9,743.8	-169.3	9,745.3	0.00	0.00	0.00
22,900.0	90.00	359.42	12,560.0	9,843.8	-170.4	9,845.3	0.00	0.00	0.00
23,000.0	90.00	359.42	12,560.0	9,943.8	-171.4	9,945.3	0.00	0.00	0.00
23,100.0	90.00	359.42	12,560.0	10,043.8	-172.4	10,045.3	0.00	0.00	0.00
23,200.0	90.00	359.42	12,560.0	10,143.8	-173.4	10,145.3	0.00	0.00	0.00
Cam121 LTP									
23,283.4	90.00	359.42	12,560.0	10,227.1	-174.3	10,228.6	0.00	0.00	0.00
Cam121 BHL									

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Sec 28	0.00	0.00	10,236.0	-5,570.2	-214.7	367,878.13	868,279.00	32° 0' 25.171 N	103° 16' 42.920 W
- plan misses target center by 4914.8usft at 10400.0usft MD (10366.4 TVD, -661.8 N, 0.0 E)									
- Polygon									
Point 1			10,236.0	0.0	0.0	367,878.13	868,279.00		
Point 2			10,236.0	5,283.8	-52.1	373,161.93	868,226.90		
Point 3			10,236.0	5,342.2	5,232.0	373,220.33	873,511.00		
Point 4			10,236.0	60.2	5,286.0	367,938.33	873,565.00		
Sec 21	0.00	0.00	11,767.0	-286.4	-266.9	373,161.95	868,226.87	32° 1' 17.458 N	103° 16' 42.927 W
- plan misses target center by 460.8usft at 11800.6usft MD (11767.0 TVD, -662.0 N, 0.0 E)									
- Polygon									
Point 1			11,767.0	0.0	0.0	373,161.95	868,226.87		
Point 2			11,767.0	5,281.5	-54.5	378,443.45	868,172.37		
Point 3			11,767.0	5,336.0	5,230.6	378,497.95	873,457.47		
Point 4			11,767.0	58.4	5,284.2	373,220.35	873,511.07		
Sec 16	0.00	0.00	11,767.0	4,995.2	-321.4	378,443.47	868,172.36	32° 2' 9.723 N	103° 16' 42.961 W
- plan misses target center by 818.0usft at 18053.2usft MD (12560.0 TVD, 4997.2 N, -120.9 E)									
- Polygon									
Point 1			11,767.0	0.0	0.0	378,443.47	868,172.36		
Point 2			11,767.0	5,280.0	-53.4	383,723.47	868,118.96		
Point 3			11,767.0	5,332.5	5,230.8	383,775.97	873,403.16		
Point 4			11,767.0	54.4	5,285.1	378,497.87	873,457.46		
Cam121 LTP	0.00	0.00	12,560.0	10,177.2	-173.8	383,625.46	868,319.96	32° 3' 0.982 N	103° 16' 40.658 W
- plan misses target center by 33.4usft at 23200.0usft MD (12560.0 TVD, 10143.8 N, -173.4 E)									
- Point									
Cam121 BHL	0.00	0.00	12,560.0	10,227.1	-174.3	383,675.45	868,319.47	32° 3' 1.477 N	103° 16' 40.658 W
- plan hits target center									
- Point									
Cam121 FTP	0.00	0.00	12,560.0	-184.1	-68.0	373,264.16	868,425.77	32° 1' 18.450 N	103° 16' 40.605 W
- plan hits target center									
- Point									

AMEREDEV

Ameredev Operating, LLC.

CAM/AZ
CAM/AZ #1N
Camellia 121H
Wellbore #1

Plan: Design #1

Lease Penetration Section Line Footages

16 January, 2019

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Project	CAM/AZ		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	CAM/AZ #1N				
Site Position:		**Northing:**	373,448.30 usft	**Latitude:**	32° 1' 20.266 N
From:	Lat/Long	**Easting:**	868,493.74 usft	**Longitude:**	103° 16' 39.795 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.56 °

Well	Camellia 121H				
Well Position	**+N/-S**	0.0 usft	**Northing:**	373,448.30 usft	**Latitude:** 32° 1' 20.266 N
	+E/-W	0.0 usft	**Easting:**	868,493.74 usft	**Longitude:** 103° 16' 39.795 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:** 2,924.0 usft

Wellbore	Wellbore #1			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	1/11/2019	6.63	59.90	47,691.06803742

Design	Design #1			
Audit Notes:				
Version:	**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.0	0.0	0.0	359.02

Survey Tool Program **Date** 1/16/2019

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	23,283.4	Design #1 (Wellbore #1)	MWD	OWSG MWD - Standard

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
0.0	0.00	0.00	0.0	283.0	270.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	283.0	270.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	283.0	270.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	283.0	270.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	283.0	270.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	283.0	270.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	283.0	270.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	283.0	270.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	283.0	270.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	283.0	270.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	283.0	270.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	283.0	270.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	283.0	270.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	283.0	270.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	283.0	270.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	283.0	270.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	283.0	270.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	283.0	270.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	283.0	270.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	283.0	270.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	283.0	270.0	0.0	0.00	0.00	0.00
2,100.0	2.00	180.00	2,100.0	281.3	270.0	-1.7	2.00	2.00	0.00
2,200.0	4.00	180.00	2,199.8	276.0	270.0	-7.0	2.00	2.00	0.00
2,300.0	6.00	180.00	2,299.5	267.3	270.0	-15.7	2.00	2.00	0.00
2,400.0	6.00	180.00	2,398.9	256.9	270.0	-26.1	0.00	0.00	0.00
2,500.0	6.00	180.00	2,498.4	246.4	270.0	-36.6	0.00	0.00	0.00
2,600.0	6.00	180.00	2,597.8	235.9	270.0	-47.0	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
2,700.0	6.00	180.00	2,697.3	225.5	270.0	-57.5	0.00	0.00	0.00
2,800.0	6.00	180.00	2,796.7	215.0	270.0	-67.9	0.00	0.00	0.00
2,900.0	6.00	180.00	2,896.2	204.6	270.0	-78.4	0.00	0.00	0.00
3,000.0	6.00	180.00	2,995.6	194.1	270.0	-88.9	0.00	0.00	0.00
3,100.0	6.00	180.00	3,095.1	183.7	270.0	-99.3	0.00	0.00	0.00
3,200.0	6.00	180.00	3,194.5	173.2	270.0	-109.8	0.00	0.00	0.00
3,300.0	6.00	180.00	3,294.0	162.8	270.0	-120.2	0.00	0.00	0.00
3,400.0	6.00	180.00	3,393.4	152.3	270.0	-130.7	0.00	0.00	0.00
3,500.0	6.00	180.00	3,492.9	141.9	270.0	-141.1	0.00	0.00	0.00
3,600.0	6.00	180.00	3,592.3	131.4	270.0	-151.6	0.00	0.00	0.00
3,700.0	6.00	180.00	3,691.8	121.0	270.0	-162.0	0.00	0.00	0.00
3,800.0	6.00	180.00	3,791.2	110.5	270.0	-172.5	0.00	0.00	0.00
3,900.0	6.00	180.00	3,890.7	100.1	270.0	-182.9	0.00	0.00	0.00
4,000.0	6.00	180.00	3,990.1	89.6	270.0	-193.4	0.00	0.00	0.00
4,100.0	6.00	180.00	4,089.6	79.2	270.0	-203.8	0.00	0.00	0.00
4,200.0	6.00	180.00	4,189.0	68.7	270.0	-214.3	0.00	0.00	0.00
4,300.0	6.00	180.00	4,288.5	58.2	270.0	-224.7	0.00	0.00	0.00
4,400.0	6.00	180.00	4,387.9	47.8	270.0	-235.2	0.00	0.00	0.00
4,500.0	6.00	180.00	4,487.4	37.3	270.0	-245.6	0.00	0.00	0.00
4,600.0	6.00	180.00	4,586.9	26.9	270.0	-256.1	0.00	0.00	0.00
4,700.0	6.00	180.00	4,686.3	16.4	270.0	-266.5	0.00	0.00	0.00
4,800.0	6.00	180.00	4,785.8	6.0	270.0	-277.0	0.00	0.00	0.00
4,900.0	6.00	180.00	4,885.2	-4.5	270.0	-287.4	0.00	0.00	0.00
5,000.0	6.00	180.00	4,984.7	-14.9	270.0	-297.9	0.00	0.00	0.00
5,100.0	6.00	180.00	5,084.1	-25.4	270.0	-308.3	0.00	0.00	0.00
5,200.0	6.00	180.00	5,183.6	-35.8	270.0	-318.8	0.00	0.00	0.00
5,300.0	6.00	180.00	5,283.0	-46.3	270.0	-329.2	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
5,400.0	6.00	180.00	5,382.5	-56.7	270.0	-339.7	0.00	0.00	0.00
5,500.0	6.00	180.00	5,481.9	-67.2	270.0	-350.1	0.00	0.00	0.00
5,600.0	6.00	180.00	5,581.4	-77.6	270.0	-360.6	0.00	0.00	0.00
5,700.0	6.00	180.00	5,680.8	-88.1	270.0	-371.0	0.00	0.00	0.00
5,800.0	6.00	180.00	5,780.3	-98.5	270.0	-381.5	0.00	0.00	0.00
5,900.0	6.00	180.00	5,879.7	-109.0	270.0	-391.9	0.00	0.00	0.00
6,000.0	6.00	180.00	5,979.2	-119.4	270.0	-402.4	0.00	0.00	0.00
6,100.0	6.00	180.00	6,078.6	-129.9	270.0	-412.8	0.00	0.00	0.00
6,200.0	6.00	180.00	6,178.1	-140.4	270.0	-423.3	0.00	0.00	0.00
6,300.0	6.00	180.00	6,277.5	-150.8	270.0	-433.7	0.00	0.00	0.00
6,400.0	6.00	180.00	6,377.0	-161.3	270.0	-444.2	0.00	0.00	0.00
6,500.0	6.00	180.00	6,476.4	-171.7	270.0	-454.6	0.00	0.00	0.00
6,600.0	6.00	180.00	6,575.9	-182.2	270.0	-465.1	0.00	0.00	0.00
6,700.0	6.00	180.00	6,675.3	-192.6	270.0	-475.5	0.00	0.00	0.00
6,724.8	6.00	180.00	6,700.0	-195.2	270.0	-478.1	0.00	0.00	0.00
6,800.0	4.50	180.00	6,774.9	-202.1	270.0	-485.0	2.00	-2.00	0.00
6,900.0	2.50	180.00	6,874.7	-208.2	270.0	-491.1	2.00	-2.00	0.00
7,000.0	0.50	180.00	6,974.7	-210.8	270.0	-493.7	2.00	-2.00	0.00
7,024.8	0.00	0.00	6,999.5	-210.9	270.0	-493.8	2.00	-2.00	0.00
7,100.0	0.00	0.00	7,074.7	-210.9	270.0	-493.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,174.7	-210.9	270.0	-493.8	0.00	0.00	0.00
7,300.0	0.00	0.00	7,274.7	-210.9	270.0	-493.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,374.7	-210.9	270.0	-493.8	0.00	0.00	0.00
7,500.0	0.00	0.00	7,474.7	-210.9	270.0	-493.8	0.00	0.00	0.00
7,600.0	0.00	0.00	7,574.7	-210.9	270.0	-493.8	0.00	0.00	0.00
7,700.0	0.00	0.00	7,674.7	-210.9	270.0	-493.8	0.00	0.00	0.00
7,800.0	0.00	0.00	7,774.7	-210.9	270.0	-493.8	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
7,900.0	0.00	0.00	7,874.7	-210.9	270.0	-493.8	0.00	0.00	0.00
8,000.0	0.00	0.00	7,974.7	-210.9	270.0	-493.8	0.00	0.00	0.00
8,100.0	0.00	0.00	8,074.7	-210.9	270.0	-493.8	0.00	0.00	0.00
8,200.0	0.00	0.00	8,174.7	-210.9	270.0	-493.8	0.00	0.00	0.00
8,300.0	0.00	0.00	8,274.7	-210.9	270.0	-493.8	0.00	0.00	0.00
8,400.0	0.00	0.00	8,374.7	-210.9	270.0	-493.8	0.00	0.00	0.00
8,500.0	0.00	0.00	8,474.7	-210.9	270.0	-493.8	0.00	0.00	0.00
8,525.3	0.00	0.00	8,500.0	-210.9	270.0	-493.8	0.00	0.00	0.00
8,600.0	1.49	180.00	8,574.7	-211.9	270.0	-494.8	2.00	2.00	0.00
8,700.0	3.49	180.00	8,674.6	-216.2	270.0	-499.2	2.00	2.00	0.00
8,800.0	5.49	180.00	8,774.2	-224.1	270.0	-507.0	2.00	2.00	0.00
8,825.3	6.00	180.00	8,799.5	-226.6	270.0	-509.5	2.00	2.00	0.00
8,900.0	6.00	180.00	8,873.7	-234.4	270.0	-517.3	0.00	0.00	0.00
9,000.0	6.00	180.00	8,973.2	-244.9	270.0	-527.8	0.00	0.00	0.00
9,100.0	6.00	180.00	9,072.6	-255.3	270.0	-538.2	0.00	0.00	0.00
9,200.0	6.00	180.00	9,172.1	-265.8	270.0	-548.7	0.00	0.00	0.00
9,300.0	6.00	180.00	9,271.5	-276.2	270.0	-559.1	0.00	0.00	0.00
9,400.0	6.00	180.00	9,371.0	-286.7	270.0	-569.6	0.00	0.00	0.00
9,500.0	6.00	180.00	9,470.4	-297.1	270.0	-580.0	0.00	0.00	0.00
9,600.0	6.00	180.00	9,569.9	-307.6	270.0	-590.5	0.00	0.00	0.00
9,700.0	6.00	180.00	9,669.3	-318.0	270.0	-600.9	0.00	0.00	0.00
9,800.0	6.00	180.00	9,768.8	-328.5	270.0	-611.4	0.00	0.00	0.00
9,900.0	6.00	180.00	9,868.2	-338.9	270.0	-621.8	0.00	0.00	0.00
10,000.0	6.00	180.00	9,967.7	-349.4	270.0	-632.3	0.00	0.00	0.00
10,100.0	6.00	180.00	10,067.1	-359.8	270.0	-642.7	0.00	0.00	0.00
10,133.0	6.00	180.00	10,100.0	-363.3	270.0	-646.2	0.00	0.00	0.00
10,200.0	4.66	180.00	10,166.7	-369.5	270.0	-652.4	2.00	-2.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
10,300.0	2.66	180.00	10,266.5	-375.9	270.0	-658.8	2.00	-2.00	0.00
10,400.0	0.66	180.00	10,366.4	-378.8	270.0	-661.7	2.00	-2.00	0.00
Sec 28									
10,433.0	0.00	0.00	10,399.5	-379.0	270.0	-661.9	2.00	-2.00	0.00
10,500.0	0.00	0.00	10,466.4	-379.0	270.0	-661.9	0.00	0.00	0.00
10,600.0	0.00	0.00	10,566.4	-379.0	270.0	-661.9	0.00	0.00	0.00
10,700.0	0.00	0.00	10,666.4	-379.0	270.0	-661.9	0.00	0.00	0.00
10,800.0	0.00	0.00	10,766.4	-379.0	270.0	-661.9	0.00	0.00	0.00
10,900.0	0.00	0.00	10,866.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,000.0	0.00	0.00	10,966.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,100.0	0.00	0.00	11,066.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,200.0	0.00	0.00	11,166.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,300.0	0.00	0.00	11,266.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,400.0	0.00	0.00	11,366.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,500.0	0.00	0.00	11,466.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,600.0	0.00	0.00	11,566.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,700.0	0.00	0.00	11,666.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,800.0	0.00	0.00	11,766.4	-379.0	270.0	-661.9	0.00	0.00	0.00
11,800.6	0.00	0.00	11,767.0	-379.0	270.0	-661.9	0.00	0.00	0.00
Sec 21									
11,900.0	0.00	0.00	11,866.4	-379.0	270.0	-661.9	0.00	0.00	0.00
12,000.0	0.00	0.00	11,966.4	-379.0	270.0	-661.9	0.00	0.00	0.00
12,033.6	0.00	0.00	12,000.0	-379.0	270.0	-661.9	0.00	0.00	0.00
12,094.7	7.29	248.11	12,061.0	-380.4	266.4	-663.3	11.93	11.93	0.00
12,100.0	7.09	252.88	12,066.2	-380.7	265.8	-663.5	11.93	-3.84	90.26
12,200.0	12.00	325.31	12,165.1	-373.9	253.9	-656.5	11.93	4.91	72.43
12,300.0	22.82	342.96	12,260.4	-346.7	242.3	-629.1	11.93	10.82	17.65

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
12,400.0	34.36	349.38	12,348.1	-300.3	231.4	-582.5	11.93	11.54	6.41
12,500.0	46.08	352.83	12,424.3	-236.5	221.6	-518.7	11.93	11.72	3.45
12,600.0	57.87	355.12	12,485.8	-158.3	213.5	-440.3	11.93	11.79	2.30
12,700.0	69.69	356.89	12,529.9	-69.0	207.3	-350.9	11.93	11.82	1.76
12,800.0	81.53	358.40	12,554.7	27.6	203.4	-254.2	11.93	11.84	1.51
12,871.5	90.00	359.42	12,560.0	98.9	202.0	-183.0	11.93	11.84	1.42
Cam121 FTP									
12,900.0	90.00	359.42	12,560.0	127.3	201.7	-154.5	0.00	0.00	0.00
13,000.0	90.00	359.42	12,560.0	227.3	200.7	-54.5	0.00	0.00	0.00
13,100.0	90.00	359.42	12,560.0	327.3	199.7	45.5	0.00	0.00	0.00
13,200.0	90.00	359.42	12,560.0	427.3	198.7	145.5	0.00	0.00	0.00
13,300.0	90.00	359.42	12,560.0	527.3	197.7	245.5	0.00	0.00	0.00
13,400.0	90.00	359.42	12,560.0	627.3	196.6	345.5	0.00	0.00	0.00
13,500.0	90.00	359.42	12,560.0	727.3	195.6	445.5	0.00	0.00	0.00
13,600.0	90.00	359.42	12,560.0	827.3	194.6	545.5	0.00	0.00	0.00
13,700.0	90.00	359.42	12,560.0	927.3	193.6	645.5	0.00	0.00	0.00
13,800.0	90.00	359.42	12,560.0	1,027.3	192.5	745.5	0.00	0.00	0.00
13,900.0	90.00	359.42	12,560.0	1,127.3	191.5	845.5	0.00	0.00	0.00
14,000.0	90.00	359.42	12,560.0	1,227.3	190.5	945.5	0.00	0.00	0.00
14,100.0	90.00	359.42	12,560.0	1,327.3	189.5	1,045.5	0.00	0.00	0.00
14,200.0	90.00	359.42	12,560.0	1,427.3	188.5	1,145.5	0.00	0.00	0.00
14,300.0	90.00	359.42	12,560.0	1,527.3	187.4	1,245.5	0.00	0.00	0.00
14,400.0	90.00	359.42	12,560.0	1,627.2	186.4	1,345.5	0.00	0.00	0.00
14,500.0	90.00	359.42	12,560.0	1,727.2	185.4	1,445.5	0.00	0.00	0.00
14,600.0	90.00	359.42	12,560.0	1,827.2	184.4	1,545.5	0.00	0.00	0.00
14,700.0	90.00	359.42	12,560.0	1,927.2	183.4	1,645.5	0.00	0.00	0.00
14,800.0	90.00	359.42	12,560.0	2,027.2	182.3	1,745.5	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
14,900.0	90.00	359.42	12,560.0	2,127.2	181.3	1,845.5	0.00	0.00	0.00
15,000.0	90.00	359.42	12,560.0	2,227.2	180.3	1,945.5	0.00	0.00	0.00
15,100.0	90.00	359.42	12,560.0	2,327.2	179.3	2,045.5	0.00	0.00	0.00
15,200.0	90.00	359.42	12,560.0	2,427.2	178.3	2,145.5	0.00	0.00	0.00
15,300.0	90.00	359.42	12,560.0	2,527.2	177.2	2,245.5	0.00	0.00	0.00
15,400.0	90.00	359.42	12,560.0	2,627.2	176.2	2,345.5	0.00	0.00	0.00
15,500.0	90.00	359.42	12,560.0	2,727.2	175.2	2,445.5	0.00	0.00	0.00
15,600.0	90.00	359.42	12,560.0	2,827.2	174.2	2,545.5	0.00	0.00	0.00
15,700.0	90.00	359.42	12,560.0	2,927.2	173.1	2,645.4	0.00	0.00	0.00
15,800.0	90.00	359.42	12,560.0	3,027.2	172.1	2,745.4	0.00	0.00	0.00
15,900.0	90.00	359.42	12,560.0	3,127.2	171.1	2,845.4	0.00	0.00	0.00
16,000.0	90.00	359.42	12,560.0	3,227.2	170.1	2,945.4	0.00	0.00	0.00
16,100.0	90.00	359.42	12,560.0	3,327.2	169.1	3,045.4	0.00	0.00	0.00
16,200.0	90.00	359.42	12,560.0	3,427.2	168.0	3,145.4	0.00	0.00	0.00
16,300.0	90.00	359.42	12,560.0	3,527.2	167.0	3,245.4	0.00	0.00	0.00
16,400.0	90.00	359.42	12,560.0	3,627.1	166.0	3,345.4	0.00	0.00	0.00
16,500.0	90.00	359.42	12,560.0	3,727.1	165.0	3,445.4	0.00	0.00	0.00
16,600.0	90.00	359.42	12,560.0	3,827.1	164.0	3,545.4	0.00	0.00	0.00
16,700.0	90.00	359.42	12,560.0	3,927.1	162.9	3,645.4	0.00	0.00	0.00
16,800.0	90.00	359.42	12,560.0	4,027.1	161.9	3,745.4	0.00	0.00	0.00
16,900.0	90.00	359.42	12,560.0	4,127.1	160.9	3,845.4	0.00	0.00	0.00
17,000.0	90.00	359.42	12,560.0	4,227.1	159.9	3,945.4	0.00	0.00	0.00
17,100.0	90.00	359.42	12,560.0	4,327.1	158.9	4,045.4	0.00	0.00	0.00
17,200.0	90.00	359.42	12,560.0	4,427.1	157.8	4,145.4	0.00	0.00	0.00
17,300.0	90.00	359.42	12,560.0	4,527.1	156.8	4,245.4	0.00	0.00	0.00
17,400.0	90.00	359.42	12,560.0	4,627.1	155.8	4,345.4	0.00	0.00	0.00
17,500.0	90.00	359.42	12,560.0	4,727.1	154.8	4,445.4	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
17,600.0	90.00	359.42	12,560.0	4,827.1	153.8	4,545.4	0.00	0.00	0.00
17,700.0	90.00	359.42	12,560.0	4,927.1	152.7	4,645.4	0.00	0.00	0.00
17,800.0	90.00	359.42	12,560.0	5,027.1	151.7	4,745.4	0.00	0.00	0.00
17,900.0	90.00	359.42	12,560.0	5,127.1	150.7	4,845.4	0.00	0.00	0.00
18,000.0	90.00	359.42	12,560.0	5,227.1	149.7	4,945.4	0.00	0.00	0.00
18,053.2	90.00	359.42	12,560.0	5,280.2	149.1	4,998.5	0.00	0.00	0.00
Sec 16									
18,100.0	90.00	359.42	12,560.0	5,327.1	148.6	5,045.4	0.00	0.00	0.00
18,200.0	90.00	359.42	12,560.0	5,427.1	147.6	5,145.4	0.00	0.00	0.00
18,300.0	90.00	359.42	12,560.0	5,527.0	146.6	5,245.4	0.00	0.00	0.00
18,400.0	90.00	359.42	12,560.0	5,627.0	145.6	5,345.4	0.00	0.00	0.00
18,500.0	90.00	359.42	12,560.0	5,727.0	144.6	5,445.4	0.00	0.00	0.00
18,600.0	90.00	359.42	12,560.0	5,827.0	143.5	5,545.4	0.00	0.00	0.00
18,700.0	90.00	359.42	12,560.0	5,927.0	142.5	5,645.4	0.00	0.00	0.00
18,800.0	90.00	359.42	12,560.0	6,027.0	141.5	5,745.4	0.00	0.00	0.00
18,900.0	90.00	359.42	12,560.0	6,127.0	140.5	5,845.4	0.00	0.00	0.00
19,000.0	90.00	359.42	12,560.0	6,227.0	139.5	5,945.4	0.00	0.00	0.00
19,100.0	90.00	359.42	12,560.0	6,327.0	138.4	6,045.4	0.00	0.00	0.00
19,200.0	90.00	359.42	12,560.0	6,427.0	137.4	6,145.4	0.00	0.00	0.00
19,300.0	90.00	359.42	12,560.0	6,527.0	136.4	6,245.4	0.00	0.00	0.00
19,400.0	90.00	359.42	12,560.0	6,627.0	135.4	6,345.4	0.00	0.00	0.00
19,500.0	90.00	359.42	12,560.0	6,727.0	134.4	6,445.4	0.00	0.00	0.00
19,600.0	90.00	359.42	12,560.0	6,827.0	133.3	6,545.4	0.00	0.00	0.00
19,700.0	90.00	359.42	12,560.0	6,927.0	132.3	6,645.4	0.00	0.00	0.00
19,800.0	90.00	359.42	12,560.0	7,027.0	131.3	6,745.4	0.00	0.00	0.00
19,900.0	90.00	359.42	12,560.0	7,127.0	130.3	6,845.3	0.00	0.00	0.00
20,000.0	90.00	359.42	12,560.0	7,227.0	129.3	6,945.3	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
20,100.0	90.00	359.42	12,560.0	7,327.0	128.2	7,045.3	0.00	0.00	0.00
20,200.0	90.00	359.42	12,560.0	7,426.9	127.2	7,145.3	0.00	0.00	0.00
20,300.0	90.00	359.42	12,560.0	7,526.9	126.2	7,245.3	0.00	0.00	0.00
20,400.0	90.00	359.42	12,560.0	7,626.9	125.2	7,345.3	0.00	0.00	0.00
20,500.0	90.00	359.42	12,560.0	7,726.9	124.1	7,445.3	0.00	0.00	0.00
20,600.0	90.00	359.42	12,560.0	7,826.9	123.1	7,545.3	0.00	0.00	0.00
20,700.0	90.00	359.42	12,560.0	7,926.9	122.1	7,645.3	0.00	0.00	0.00
20,800.0	90.00	359.42	12,560.0	8,026.9	121.1	7,745.3	0.00	0.00	0.00
20,900.0	90.00	359.42	12,560.0	8,126.9	120.1	7,845.3	0.00	0.00	0.00
21,000.0	90.00	359.42	12,560.0	8,226.9	119.0	7,945.3	0.00	0.00	0.00
21,100.0	90.00	359.42	12,560.0	8,326.9	118.0	8,045.3	0.00	0.00	0.00
21,200.0	90.00	359.42	12,560.0	8,426.9	117.0	8,145.3	0.00	0.00	0.00
21,300.0	90.00	359.42	12,560.0	8,526.9	116.0	8,245.3	0.00	0.00	0.00
21,400.0	90.00	359.42	12,560.0	8,626.9	115.0	8,345.3	0.00	0.00	0.00
21,500.0	90.00	359.42	12,560.0	8,726.9	113.9	8,445.3	0.00	0.00	0.00
21,600.0	90.00	359.42	12,560.0	8,826.9	112.9	8,545.3	0.00	0.00	0.00
21,700.0	90.00	359.42	12,560.0	8,926.9	111.9	8,645.3	0.00	0.00	0.00
21,800.0	90.00	359.42	12,560.0	9,026.9	110.9	8,745.3	0.00	0.00	0.00
21,900.0	90.00	359.42	12,560.0	9,126.9	109.9	8,845.3	0.00	0.00	0.00
22,000.0	90.00	359.42	12,560.0	9,226.9	108.8	8,945.3	0.00	0.00	0.00
22,100.0	90.00	359.42	12,560.0	9,326.8	107.8	9,045.3	0.00	0.00	0.00
22,200.0	90.00	359.42	12,560.0	9,426.8	106.8	9,145.3	0.00	0.00	0.00
22,300.0	90.00	359.42	12,560.0	9,526.8	105.8	9,245.3	0.00	0.00	0.00
22,400.0	90.00	359.42	12,560.0	9,626.8	104.7	9,345.3	0.00	0.00	0.00
22,500.0	90.00	359.42	12,560.0	9,726.8	103.7	9,445.3	0.00	0.00	0.00
22,600.0	90.00	359.42	12,560.0	9,826.8	102.7	9,545.3	0.00	0.00	0.00
22,700.0	90.00	359.42	12,560.0	9,926.8	101.7	9,645.3	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
22,800.0	90.00	359.42	12,560.0	10,026.8	100.7	9,745.3	0.00	0.00	0.00
22,900.0	90.00	359.42	12,560.0	10,126.8	99.6	9,845.3	0.00	0.00	0.00
23,000.0	90.00	359.42	12,560.0	10,226.8	98.6	9,945.3	0.00	0.00	0.00
23,100.0	90.00	359.42	12,560.0	10,326.8	97.6	10,045.3	0.00	0.00	0.00
23,200.0	90.00	359.42	12,560.0	10,426.8	96.6	10,145.3	0.00	0.00	0.00
Cam121 LTP									
23,283.4	90.00	359.42	12,560.0	10,510.1	95.7	10,228.6	0.00	0.00	0.00
Cam121 BHL									

AMEREDEV

American Resource Development LLC

Pressure Control Plan

Pressure Control Equipment

- Following setting of 13-3/8" Surface Casing Ameredev will install 13-5/8 MB4 Multi Bowl Casing Head by welding on a 13-5/8 SOW x 13-5/8" 5M in combination with 13-5/8 5M x 13-5/8 10M B-Sec to Land Intm #1 and a 13-5/8 10M x 13-5/8 10M shouldered to land C-Sec to Land Intm #2 (Installation procedure witnessed and verified by a manufacturer's representative).

- Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Ameredev will install a 5M System Blowout Preventer (BOPE) with a 5M Annular Preventer and related equipment (BOPE). Full testing will be performed utilizing a full isolation test plug and limited to 5,000 psi MOP of MB4 Multi Bowl Casing Head. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 50% of approved working pressure (2,500 psi). Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Setting of 9-5/8" Intermediate will be done by landing a wellhead hanger in the 13-5/8" 5M Bowl, Cementing and setting Well Head Packing seals and testing same. (Installation procedure witnessed and verified by a manufacturer's representative) Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Full testing will be performed utilizing a full isolation test plug to 10,000 psi MOP of MB4 Multi Bowl B-Section. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 100% of approved working pressure (5,000 psi).

- Before drilling >20ft of new formation under the 9-5/8" Casing Shoe a pressure integrity test of the Casing Shoe will be performed to minimum of the MWE anticipated to control formation pressure to the next casing depth.

- Following setting of 5-1/2" Production Casing and adequate WOC time Ameredev will break 10M System Blowout Preventer (BOP) from 10M DOL-2 Casing Head, install annulus casing slips and test same (Installation procedure witnessed and verified by a manufacturer's representative) and install 11" 10M x 5-1/8" 15M Tubing Head (Installation procedure witnessed and verified by a manufacturer's representative). Ameredev will test head to 70% casing design and install Dry Hole cap with needle valve and pressure gauge to monitor well awaiting completion.

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Pressure Control Plan

- Slow pump speeds will be taken daily by each crew and recorded on Daily Drilling Report after mudding up.

- A choke manifold and accumulator with floor and remote operating stations will be functional and in place after installation of BOPE, as well as full functioning mud gas separator.

- Weekly BOPE pit level drills will be conducted by each crew and recorded on Daily Drilling Report.

- BOP will be fully operated when out of hole and will be documented on the daily drilling log.

- All B.O.P.s and associated equipment will be tested in accordance with Onshore Order #2

- All B.O.P. testing will be done by an independent service company.

- The B.O.P. will be tested within 21 days of the original test if drilling takes more time than planned.

- Ameredev requests a variance to connect the B.O.P. choke outlet to the choke manifold using a co-flex hose with a 10,000 psi working pressure that has been tested to 15,000psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps. (certifications will be sent to Carlsbad BLM Office prior to install)

- Ameredev requests a variance to install a 5M Annular Preventer on the 10M System to drill the Production Hole below the 9-5/8" Intermediate Section. 5M Annular will be tested to 100% working pressure (5,000 psi). A full well control procedure will be included to isolate well bore.

Ameredev Drilling Plan: 3 String with 4 String Contingency

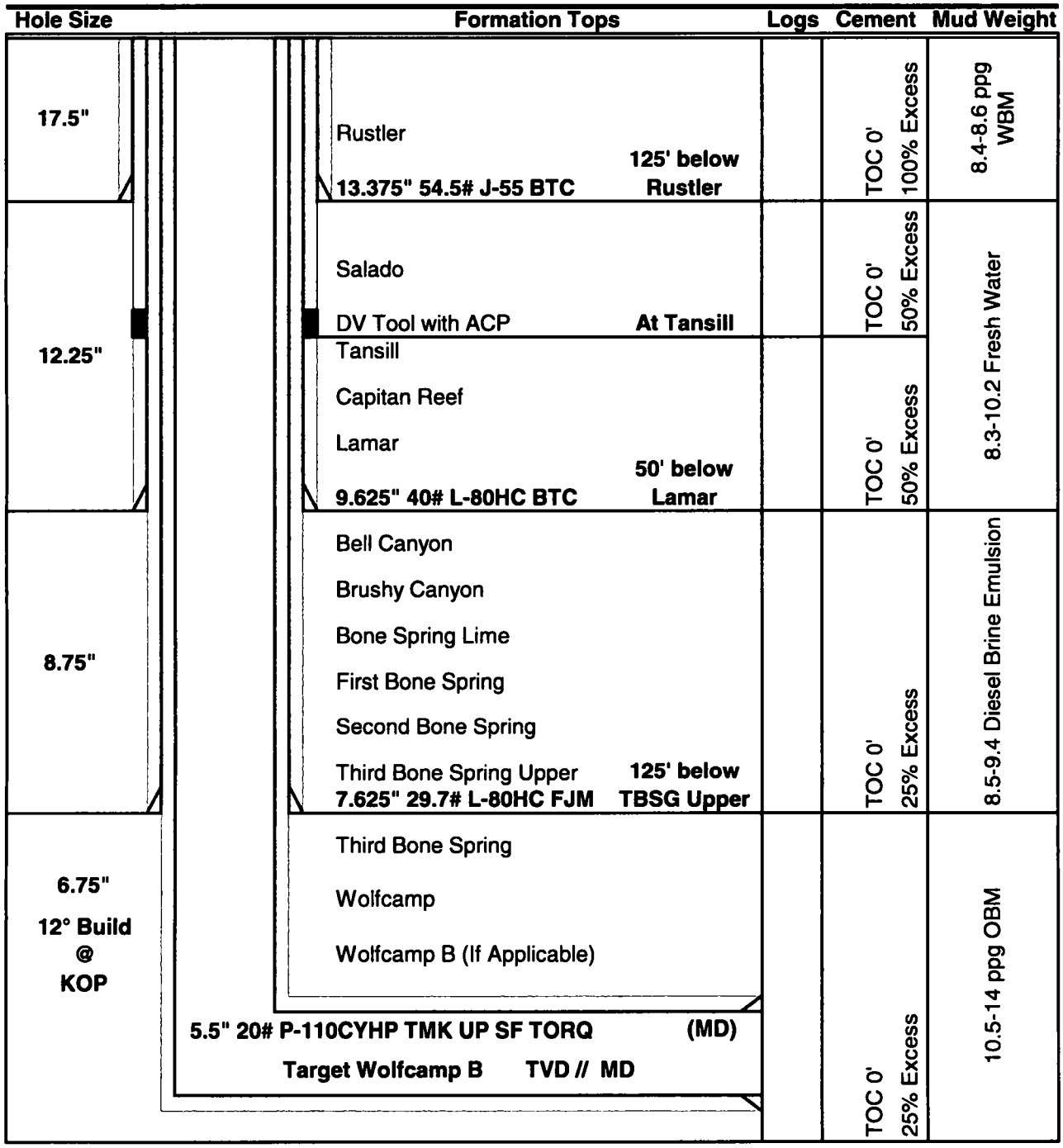
- Contingency Plan If Losses Exceed 50% in Intermediate Interval
  - We will utilize a MB4 wellhead that will enable us to convert a 3 string design to a 4 string design. (Schematic Attached)
  - We will displace well with FW and drill or condition to run 9-5/8" Casing at the Lamar Limestone, we will utilize DV Tool w/ ACP @ the Tansill to Isolate Capitan Reef and cement to surface.
  - Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- 7.625 Casing will be Additional 4th String
  - Drill remaining hole section to 10,670'
  - Run 7.625 29.7# HCL80 FJM Casing

AMEREDEV

4-String Contingency Wellbore Schematic

Well:	(Well Name)	**Co. Well ID:**	xxxxxx
SHL:	(SHL)	**AFE No.:**	xxxx-xxx
BHL:	(BHL)	**API No.:**	xxxxxxxxxx
	Lea, NM	**GL:**	(Elevation)'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Wolfcamp B
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	(TVD)'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	(MD)'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com

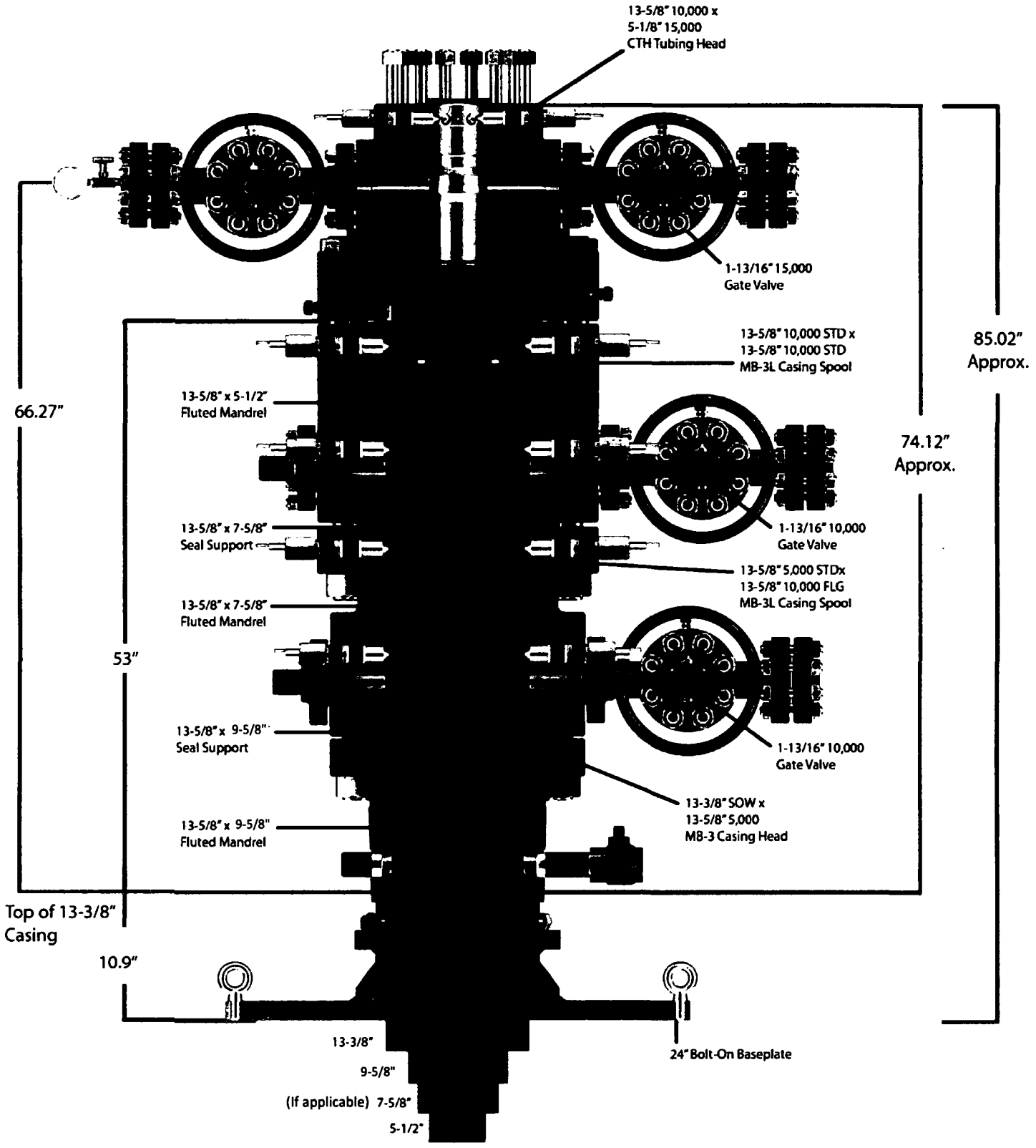


EXAMPLE ONLY - NOT FOR CONSTRUCTION

Contingency Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	1,888'	13.375	54.5	J-55	BTC
Int #1	12.25	5,013'	9.625	40	HCL-80	BTC
Int #2	8.75	11,147'	7.625	29.7	HCL-80	FJM
Prod Segment A	6.75	11,147'	5.5	20	CYHP-110	TMK UPSF
Prod Segment B	6.75	22,496'	5.5	20	CYHP-110	TMK UPSF

Check Surface Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
14.38	853	909	1,130	2,730
Safety Factors				
1.56	8.29	8.83	1.15	0.91
Check Int #1 Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
10.625	916	1042	4230	5750
Safety Factors				
0.81	4.57	5.20	1.41	0.95
Check Int #2 Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
7.625	940	558	6700	9460
Safety Factors				
0.56	2.84	1.96	1.10	1.24
Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
0.49	3.11	2.79	1.77	1.89
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
0.49	63.53	57.16	1.68	1.89



Quotation

Downing Wellhead Equipment

Oklahoma City, Oklahoma - USA

Reference Data:

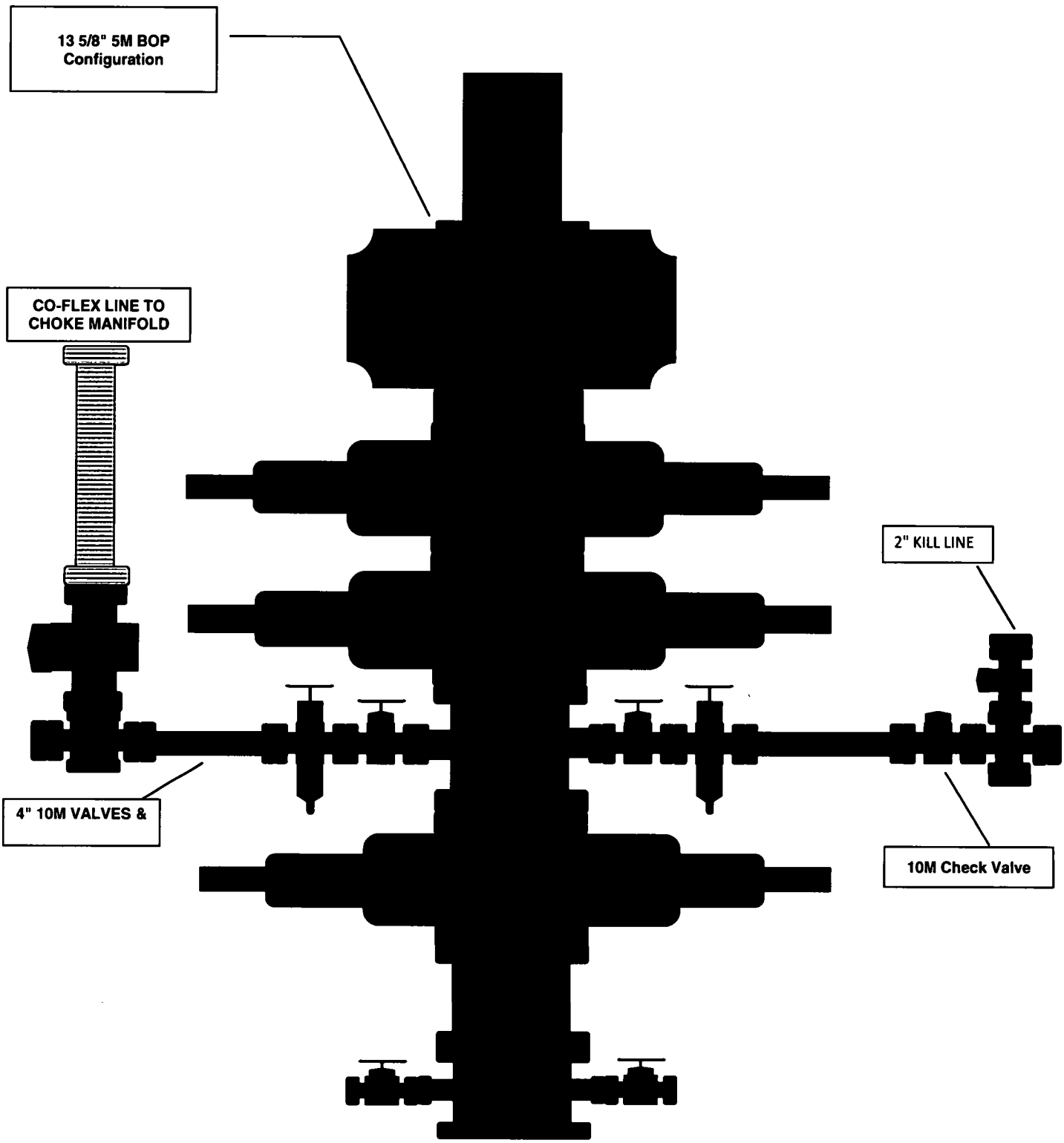
16925 AMEREDEV

Proprietary and Confidential

TITLE:

AMEREDEV

DRAWN			SIZE	DWG. NO.	REV.
CHECKED			A		
APPROVED			Scale:	Weight:	Sheet:


13 5/8" 5M BOP
Configuration
CO-FLEX LINE TO
CHOKE MANIFOLD
2" KILL LINE
4" 10M VALVES &
10M Check Valve

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Pressure Control Plan

Pressure Control Equipment

- Following setting of 13-3/8" Surface Casing Ameredev will install 13-5/8 MB4 Multi Bowl Casing Head by welding on a 13-5/8 SOW x 13-5/8" 5M in combination with 13-5/8 5M x 13-5/8 10M B-Sec to Land Intm #1 and a 13-5/8 10M x 13-5/8 10M shouldered to land C-Sec to Land Intm #2 (Installation procedure witnessed and verified by a manufacturer's representative).

- Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Ameredev will install a 5M System Blowout Preventer (BOPE) with a 5M Annular Preventer and related equipment (BOPE). Full testing will be performed utilizing a full isolation test plug and limited to 5,000 psi MOP of MB4 Multi Bowl Casing Head. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 50% of approved working pressure (2,500 psi). Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

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- Following setting of 5-1/2" Production Casing and adequate WOC time Ameredev will break 10M System Blowout Preventer (BOP) from 10M DOL-2 Casing Head, install annulus casing slips and test same (Installation procedure witnessed and verified by a manufacturer's representative) and install 11" 10M x 5-1/8" 15M Tubing Head (Installation procedure witnessed and verified by a manufacturer's representative). Ameredev will test head to 70% casing design and install Dry Hole cap with needle valve and pressure gauge to monitor well awaiting completion.

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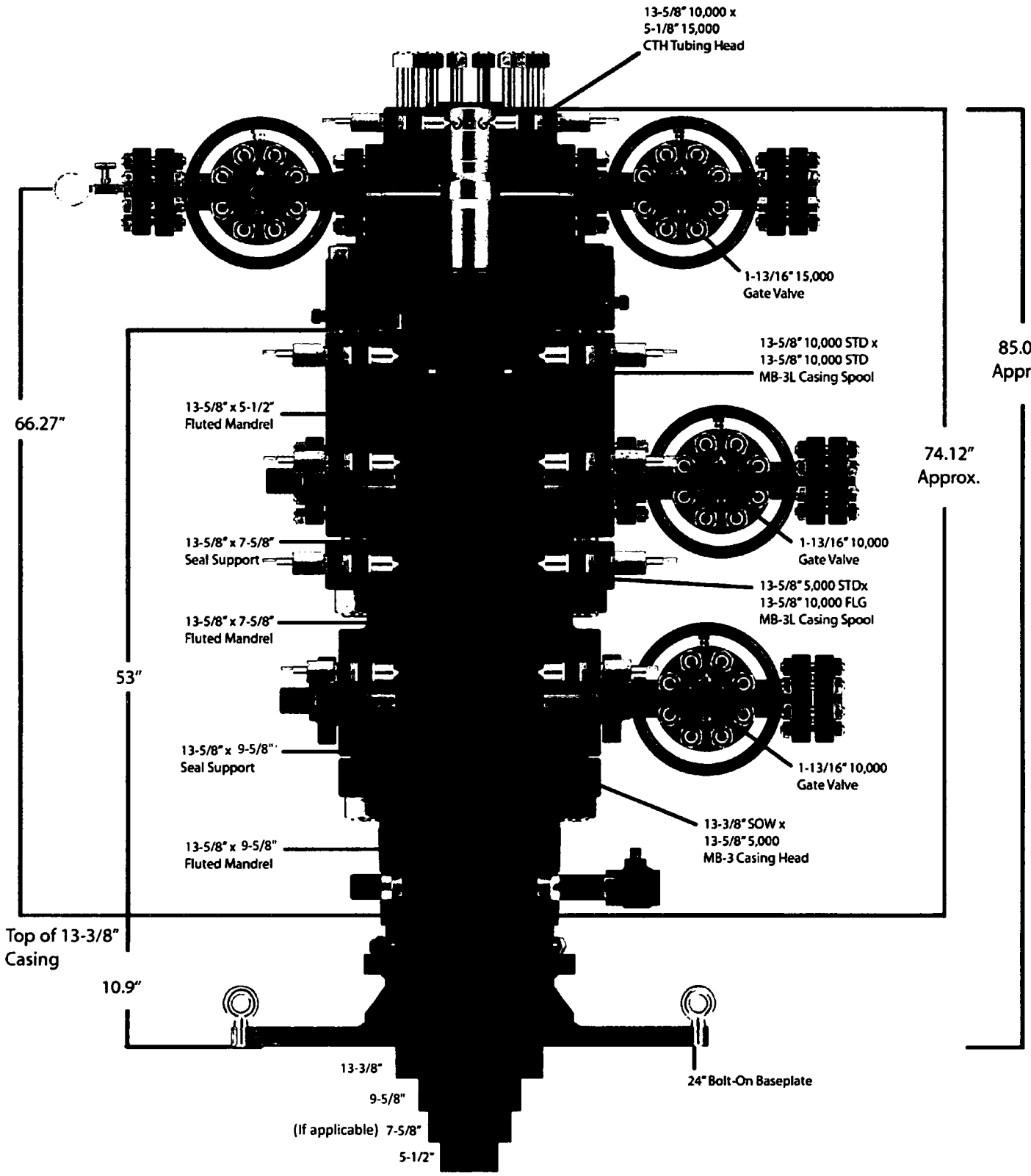

Quotation

Downing Wellhead Equipment

Oklahoma City, Oklahoma - USA

Reference Data:

16925 AMEREDEV

TITLE:

AMEREDEV

DRAWN			SIZE	DWG. NO.	REV.
CHECKED			A		
APPROVED			Scale:	Weight:	Sheet:

AMEREDEV

Wellbore Schematic

Well:	Camellia Fed Com 26-36-21 121H	**Co. Well ID:**	40921
SHL:	Sec. 21 26S-36E 283' FSL & 270' FWL	**AFE No.:**	2017-066
BHL:	Sec. 16 26S-36E 50' FNL 200' FWL	**API No.:**	xxxxxxxxxx
	Lea, NM	**GL:**	2,924'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Wolfcamp B
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	12,560'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	23,283'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB:** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com

Hole Size	Formation Tops		Logs	Cement	Mud Weight
17.5"	Rustler	1,876'		1,231 Sacks TOC 0' 100% Excess	8.4-8.6 ppg WBM
	13.375" 68# J-55 BTC	**2,001'**			
12.25"	Salado	2,224'		884 Sacks TOC 0' 50% Excess	8.5 - 9.4 ppg Diesel Brine Emulsion
	Tansill	3,206'			
	Capitan Reef	3,621'			
	Lamar	4,952'			
	DV Tool	**5,002'**			
	Bell Canyon	5,086'		1,723 Sacks TOC 0' 50% Excess	
	Brushy Canyon	7,105'			
	Bone Spring Lime	8,129'			
	First Bone Spring	9,631'			
	Second Bone Spring	10,275'			
	Third Bone Spring Upper	10,806'			
	9.625" 40# L-80HC BTC	**10,931'**			
8.5"	Third Bone Spring	11,522'		4,971 Sacks TOC 0' 25% Excess	10.5 - 12.5 ppg OBM
	Wolfcamp A	11,755'			
12° Build @ 12,034' MD thru 12,872' MD	Wolfcamp B	12,210'			
	5.5" 20# P-110CYHP BTC	**23,283'**			
	Target Wolfcamp B 12560 TVD // 23283 MD				

Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	2,001'	13.375	68	J-55	BTC
Intermediate	12.25	10,931'	9.625	40	HCL-80	BTC
Prod Segment A	8.5	12,034'	5.5	20	CYHP-110	BTC
Prod Segment B	8.5	23,283'	5.5	20	CYHP-110	BTC

Check Surface Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
14.375	1,069	915	4,100	3,450
Safety Factors				
1.56	7.86	6.72	4.59	0.65
Check Intermediate Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
7.625	940	558	6700	9460
Safety Factors				
2.31	2.15	2.19	1.26	1.16
Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	2.90	2.61	1.64	1.76
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	69.20	62.26	1.57	1.76

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Wellbore Schematic

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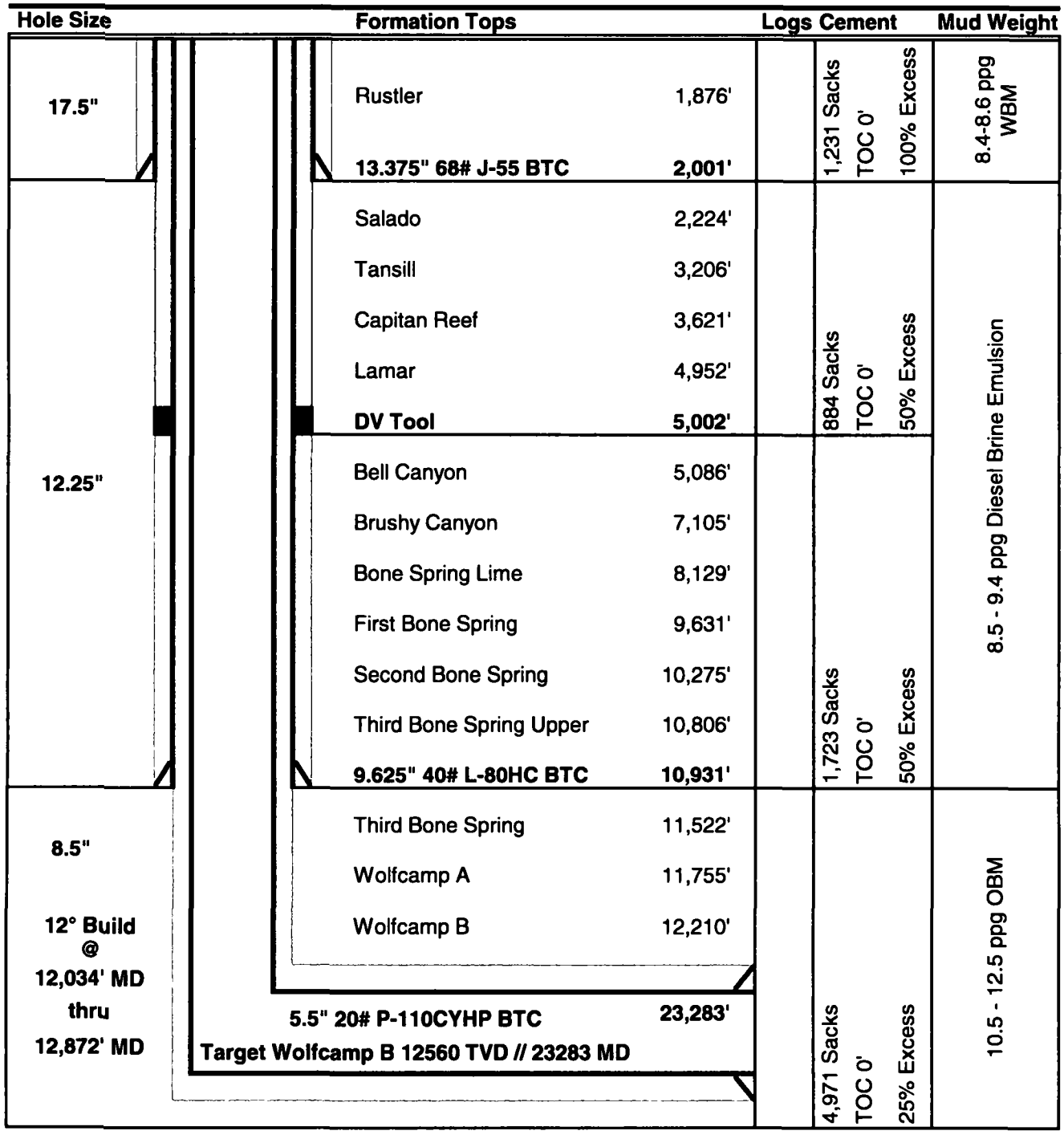
	Lea, NM	**GL:**	2,924'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Wolfcamp B
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	12,560'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	23,283'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB:** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com



Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	2,001'	13.375	68	J-55	BTC
Intermediate	12.25	10,931'	9.625	40	HCL-80	BTC
Prod Segment A	8.5	12,034'	5.5	20	CYHP-110	BTC
Prod Segment B	8.5	23,283'	5.5	20	CYHP-110	BTC

Check Surface Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
14.375	1,069	915	4,100	3,450
Safety Factors				
1.56	7.86	6.72	4.59	0.65
Check Intermediate Casing				
OD Cplg	Body	Joint	Collapse	Burst
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Safety Factors				
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Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
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Safety Factors				
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Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
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AMEREDEV

Wellbore Schematic

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	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	12,560'
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	Tansill	3,206'			
	Capitan Reef	3,621'			
	Lamar	4,952'			
	DV Tool	**5,002'**			
	Bell Canyon	5,086'		1,723 Sacks TOC 0' 50% Excess	
	Brushy Canyon	7,105'			
	Bone Spring Lime	8,129'			
	First Bone Spring	9,631'			
	Second Bone Spring	10,275'			
	Third Bone Spring Upper	10,806'			
	9.625" 40# L-80HC BTC	**10,931'**			
8.5"	Third Bone Spring	11,522'		4,971 Sacks TOC 0' 25% Excess	10.5 - 12.5 ppg OBM
	Wolfcamp A	11,755'			
12° Build @ 12,034' MD thru 12,872' MD	Wolfcamp B	12,210'			
	5.5" 20# P-110CYHP BTC	**23,283'**			
	Target Wolfcamp B 12560 TVD // 23283 MD				

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Prod Segment B	8.5	23,283'	5.5	20	CYHP-110	BTC

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Safety Factors				
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Safety Factors				
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Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	2.90	2.61	1.64	1.76
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	69.20	62.26	1.57	1.76

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H_2S Drilling Operation Plan

1. **All Company and Contract personnel admitted on location must be trained by a qualified H_2S safety instructor to the following:**
    a. Characteristics of H_2S
    b. Physical effects and hazards
    c. Principal and operation of H_2s detectors, warning system and briefing areas
    d. Evacuation procedure, routes and first aid
    e. Proper use of safety equipment and life support systems
    f. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

2. **Briefing Area:**
    a. Two perpendicular areas will be designated by signs and readily accessible.
    b. Upon location entry there will be a designated area to establish all safety compliance criteria (1.) has been met.

3. **H_2S Detection and Alarm Systems:**
    a. H_2S sensors/detectors shall be located on the drilling rig floor, in the base of the sub structure/cellar area, and on the mud pits in the shale shaker area. Additional H_2S detectors may be placed as deemed necessary. All detectors will be set to initiate visual alarm at 10 ppm and visual with audible at 14 ppm and all equipment will be calibrated every 30 days or as needed.
    b. An audio alarm will be installed on the derrick floor and in the top doghouse.

4. **Protective Equipment for Essential Personnel:**
    a. **Breathing Apparatus:**
        i. Rescue Packs (SCBA) - 1 Unit shall be placed at each briefing area.
        ii. Two (SCBA) Units will be stored in safety trailer on location.
        iii. Work/Escape packs - 1 Unit will be available on rig floor in doghouse for emergency evacuation for driller.
    b. **Auxiliary Rescue Equipment:**
        i. Stretcher
        ii. 2 - OSHA full body harnesses
        iii. 100 ft. 5/8" OSHA approved rope
        iv. 1 - 20# class ABC fire extinguisher

5. **Windsock and/or Wind Streamers:**
    a. Windsock at mud pit area should be high enough to be visible.
    b. Windsock on the rig floor should be high enough to be visible.

6. **Communication:**
    a. While working under mask scripting boards will be used for communication where applicable.
    b. Hand signals will be used when script boards are not applicable.

c. Two way radios will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at Drilling Foreman's Office.

7. **Drill Stem Testing:** - No Planned DST at this time.

8. **Mud program:**
   a. If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.

9. **Metallurgy:**

   a. All drill strings, casing, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H_2S service.
   b. Drilling Contractor supervisor will be required to be familiar with the effect H_2S has on tubular goods and other mechanical equipment provided through contractor.

AMEREDEV

H_2S Contingency Plan

Emergency Procedures

In the event of a release of H_2S, the first responder(s) must:

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H_2S monitors and air packs in order to control the release.
- Use the "buddy system" to ensure no injuries occur during the response.
- Take precautions to avoid personal injury during this operation.
- Contact Operator and/or local officials the aid in operation. See list of phone numbers attached.
- Have received training in the:
    - Detection of H_2S and
    - Measures for protection against the gas,
    - Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air=1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air=1	2 ppm	N/A	1000 ppm

Contacting Authorities

Ameredev Operating LLC personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including direction to site. The following call list of essential and potential responders has been prepared for use during a release. Ameredev Operating LLC's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER)

AMEREDEV

H_2S Contingency Plan

Ameredev Operating LLC – Emergency Phone 737-300-4799			
Key Personnel:			
Name	Title	Office	Mobile
Floyd Hammond	Chief Operating officer	737-300-4724	512-783-6810
Zachary Boyd	Operations Superintendent	737-300-4725	432-385-6996
Blake Estrada	Construction Foreman		432-385-5831

Artesia	
Ambulance	911
State Police	575-746-2703
City Police	575-746-2703
Sheriff's Office	575-746-9888
Fire Department	575-746-2701
Local Emergency Planning Committee	575-746-2122
New Mexico Oil Conservation Division	575-748-1283
Carlsbad	
Ambulance	911
State Police	575-885-3137
City Police	575-885-2111
Sheriff's Office	575-887-7551
Fire Department	575-887-3798
Local Emergency Planning Committee	575-887-6544
US Bureau of Land Management	575-887-6544
Santa Fe	
New Mexico Emergency Response Commission (Santa Fe)	505-476-9600
New Mexico Emergency Response Commission (Santa Fe) 24 Hrs	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635
National	
National Emergency Response Center (Washington, D.C.)	800-424-8802
Medical	
Flight for Life - 4000 24th St.; Lubbock, TX	806-743-9911
Aerocare - R3, Box 49F; Lubbock, TX	806-747-8923
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM	505-842-4433
.'SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM	505-842-4949

AMEREDEV

Ameredev Operating, LLC.

CAM/AZ
CAM/AZ #1N
Camellia 121H

Wellbore #1

Plan: Design #1

Standard Planning Report

16 January, 2019

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	CAM/AZ		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	CAM/AZ #1N				
Site Position:		**Northing:**	373,448.30 usft	**Latitude:**	32° 1' 20.266 N
From:	Lat/Long	**Easting:**	868,493.74 usft	**Longitude:**	103° 16' 39.795 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.56 °

Well	Camellia 121H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	373,448.30 usft	**Latitude:**	32° 1' 20.266 N
	+E/-W	0.0 usft	**Easting:**	868,493.74 usft	**Longitude:**	103° 16' 39.795 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,924.0 usft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	1/11/2019	6.63	59.90	47,691.06803742

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	359.02	

Plan Survey Tool Program **Date** 1/16/2019

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.0	23,283.4	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
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Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,300.0	6.00	180.00	2,299.5	-15.7	0.0	2.00	2.00	0.00	180.00	
6,724.8	6.00	180.00	6,700.0	-478.2	0.0	0.00	0.00	0.00	0.00	
7,024.8	0.00	0.00	6,999.5	-493.9	0.0	2.00	-2.00	0.00	180.00	
8,525.3	0.00	0.00	8,500.0	-493.9	0.0	0.00	0.00	0.00	0.00	
8,825.3	6.00	180.00	8,799.5	-509.6	0.0	2.00	2.00	0.00	180.00	
10,133.0	6.00	180.00	10,100.0	-646.3	0.0	0.00	0.00	0.00	0.00	
10,433.0	0.00	0.00	10,399.5	-662.0	0.0	2.00	-2.00	0.00	180.00	
12,033.6	0.00	0.00	12,000.0	-662.0	0.0	0.00	0.00	0.00	0.00	
12,094.7	7.29	248.11	12,061.0	-663.4	-3.6	11.93	11.93	0.00	248.11	
12,871.5	90.00	359.42	12,560.0	-184.1	-68.0	11.93	10.65	14.33	111.14	Cam121 FTP
23,283.4	90.00	359.42	12,560.0	10,227.1	-174.3	0.00	0.00	0.00	0.00	Cam121 BHL

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	2.00	180.00	2,100.0	-1.7	0.0	-1.7	2.00	2.00	0.00
2,200.0	4.00	180.00	2,199.8	-7.0	0.0	-7.0	2.00	2.00	0.00
2,300.0	6.00	180.00	2,299.5	-15.7	0.0	-15.7	2.00	2.00	0.00
2,400.0	6.00	180.00	2,398.9	-26.1	0.0	-26.1	0.00	0.00	0.00
2,500.0	6.00	180.00	2,498.4	-36.6	0.0	-36.6	0.00	0.00	0.00
2,600.0	6.00	180.00	2,597.8	-47.1	0.0	-47.0	0.00	0.00	0.00
2,700.0	6.00	180.00	2,697.3	-57.5	0.0	-57.5	0.00	0.00	0.00
2,800.0	6.00	180.00	2,796.7	-68.0	0.0	-67.9	0.00	0.00	0.00
2,900.0	6.00	180.00	2,896.2	-78.4	0.0	-78.4	0.00	0.00	0.00
3,000.0	6.00	180.00	2,995.6	-88.9	0.0	-88.9	0.00	0.00	0.00
3,100.0	6.00	180.00	3,095.1	-99.3	0.0	-99.3	0.00	0.00	0.00
3,200.0	6.00	180.00	3,194.5	-109.8	0.0	-109.8	0.00	0.00	0.00
3,300.0	6.00	180.00	3,294.0	-120.2	0.0	-120.2	0.00	0.00	0.00
3,400.0	6.00	180.00	3,393.4	-130.7	0.0	-130.7	0.00	0.00	0.00
3,500.0	6.00	180.00	3,492.9	-141.1	0.0	-141.1	0.00	0.00	0.00
3,600.0	6.00	180.00	3,592.3	-151.6	0.0	-151.6	0.00	0.00	0.00
3,700.0	6.00	180.00	3,691.8	-162.0	0.0	-162.0	0.00	0.00	0.00
3,800.0	6.00	180.00	3,791.2	-172.5	0.0	-172.5	0.00	0.00	0.00
3,900.0	6.00	180.00	3,890.7	-182.9	0.0	-182.9	0.00	0.00	0.00
4,000.0	6.00	180.00	3,990.1	-193.4	0.0	-193.4	0.00	0.00	0.00
4,100.0	6.00	180.00	4,089.6	-203.8	0.0	-203.8	0.00	0.00	0.00
4,200.0	6.00	180.00	4,189.0	-214.3	0.0	-214.3	0.00	0.00	0.00
4,300.0	6.00	180.00	4,288.5	-224.8	0.0	-224.7	0.00	0.00	0.00
4,400.0	6.00	180.00	4,387.9	-235.2	0.0	-235.2	0.00	0.00	0.00
4,500.0	6.00	180.00	4,487.4	-245.7	0.0	-245.6	0.00	0.00	0.00
4,600.0	6.00	180.00	4,586.9	-256.1	0.0	-256.1	0.00	0.00	0.00
4,700.0	6.00	180.00	4,686.3	-266.6	0.0	-266.5	0.00	0.00	0.00
4,800.0	6.00	180.00	4,785.8	-277.0	0.0	-277.0	0.00	0.00	0.00
4,900.0	6.00	180.00	4,885.2	-287.5	0.0	-287.4	0.00	0.00	0.00
5,000.0	6.00	180.00	4,984.7	-297.9	0.0	-297.9	0.00	0.00	0.00
5,100.0	6.00	180.00	5,084.1	-308.4	0.0	-308.3	0.00	0.00	0.00
5,200.0	6.00	180.00	5,183.6	-318.8	0.0	-318.8	0.00	0.00	0.00
5,300.0	6.00	180.00	5,283.0	-329.3	0.0	-329.2	0.00	0.00	0.00

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Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	6.00	180.00	5,382.5	-339.7	0.0	-339.7	0.00	0.00	0.00
5,500.0	6.00	180.00	5,481.9	-350.2	0.0	-350.1	0.00	0.00	0.00
5,600.0	6.00	180.00	5,581.4	-360.6	0.0	-360.6	0.00	0.00	0.00
5,700.0	6.00	180.00	5,680.8	-371.1	0.0	-371.0	0.00	0.00	0.00
5,800.0	6.00	180.00	5,780.3	-381.5	0.0	-381.5	0.00	0.00	0.00
5,900.0	6.00	180.00	5,879.7	-392.0	0.0	-391.9	0.00	0.00	0.00
6,000.0	6.00	180.00	5,979.2	-402.4	0.0	-402.4	0.00	0.00	0.00
6,100.0	6.00	180.00	6,078.6	-412.9	0.0	-412.8	0.00	0.00	0.00
6,200.0	6.00	180.00	6,178.1	-423.4	0.0	-423.3	0.00	0.00	0.00
6,300.0	6.00	180.00	6,277.5	-433.8	0.0	-433.7	0.00	0.00	0.00
6,400.0	6.00	180.00	6,377.0	-444.3	0.0	-444.2	0.00	0.00	0.00
6,500.0	6.00	180.00	6,476.4	-454.7	0.0	-454.6	0.00	0.00	0.00
6,600.0	6.00	180.00	6,575.9	-465.2	0.0	-465.1	0.00	0.00	0.00
6,700.0	6.00	180.00	6,675.3	-475.6	0.0	-475.5	0.00	0.00	0.00
6,724.8	6.00	180.00	6,700.0	-478.2	0.0	-478.1	0.00	0.00	0.00
6,800.0	4.50	180.00	6,774.9	-485.1	0.0	-485.0	2.00	-2.00	0.00
6,900.0	2.50	180.00	6,874.7	-491.2	0.0	-491.1	2.00	-2.00	0.00
7,000.0	0.50	180.00	6,974.7	-493.8	0.0	-493.7	2.00	-2.00	0.00
7,024.8	0.00	0.00	6,999.5	-493.9	0.0	-493.8	2.00	-2.00	0.00
7,100.0	0.00	0.00	7,074.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,174.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,300.0	0.00	0.00	7,274.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,374.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,500.0	0.00	0.00	7,474.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,600.0	0.00	0.00	7,574.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,700.0	0.00	0.00	7,674.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,800.0	0.00	0.00	7,774.7	-493.9	0.0	-493.8	0.00	0.00	0.00
7,900.0	0.00	0.00	7,874.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,000.0	0.00	0.00	7,974.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,100.0	0.00	0.00	8,074.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,200.0	0.00	0.00	8,174.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,300.0	0.00	0.00	8,274.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,400.0	0.00	0.00	8,374.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,500.0	0.00	0.00	8,474.7	-493.9	0.0	-493.8	0.00	0.00	0.00
8,525.3	0.00	0.00	8,500.0	-493.9	0.0	-493.8	0.00	0.00	0.00
8,600.0	1.49	180.00	8,574.7	-494.9	0.0	-494.8	2.00	2.00	0.00
8,700.0	3.49	180.00	8,674.6	-499.2	0.0	-499.2	2.00	2.00	0.00
8,800.0	5.49	180.00	8,774.2	-507.1	0.0	-507.0	2.00	2.00	0.00
8,825.3	6.00	180.00	8,799.5	-509.6	0.0	-509.5	2.00	2.00	0.00
8,900.0	6.00	180.00	8,873.7	-517.4	0.0	-517.3	0.00	0.00	0.00
9,000.0	6.00	180.00	8,973.2	-527.9	0.0	-527.8	0.00	0.00	0.00
9,100.0	6.00	180.00	9,072.6	-538.3	0.0	-538.2	0.00	0.00	0.00
9,200.0	6.00	180.00	9,172.1	-548.8	0.0	-548.7	0.00	0.00	0.00
9,300.0	6.00	180.00	9,271.5	-559.2	0.0	-559.1	0.00	0.00	0.00
9,400.0	6.00	180.00	9,371.0	-569.7	0.0	-569.6	0.00	0.00	0.00
9,500.0	6.00	180.00	9,470.4	-580.1	0.0	-580.0	0.00	0.00	0.00
9,600.0	6.00	180.00	9,569.9	-590.6	0.0	-590.5	0.00	0.00	0.00
9,700.0	6.00	180.00	9,669.3	-601.0	0.0	-600.9	0.00	0.00	0.00
9,800.0	6.00	180.00	9,768.8	-611.5	0.0	-611.4	0.00	0.00	0.00
9,900.0	6.00	180.00	9,868.2	-621.9	0.0	-621.8	0.00	0.00	0.00
10,000.0	6.00	180.00	9,967.7	-632.4	0.0	-632.3	0.00	0.00	0.00
10,100.0	6.00	180.00	10,067.1	-642.8	0.0	-642.7	0.00	0.00	0.00
10,133.0	6.00	180.00	10,100.0	-646.3	0.0	-646.2	0.00	0.00	0.00
10,200.0	4.66	180.00	10,166.7	-652.5	0.0	-652.4	2.00	-2.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,300.0	2.66	180.00	10,266.5	-658.9	0.0	-658.8	2.00	-2.00	0.00
10,400.0	0.66	180.00	10,366.4	-661.8	0.0	-661.7	2.00	-2.00	0.00
Sec 28									
10,433.0	0.00	0.00	10,399.5	-662.0	0.0	-661.9	2.00	-2.00	0.00
10,500.0	0.00	0.00	10,466.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,600.0	0.00	0.00	10,566.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,700.0	0.00	0.00	10,666.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,800.0	0.00	0.00	10,766.4	-662.0	0.0	-661.9	0.00	0.00	0.00
10,900.0	0.00	0.00	10,866.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,000.0	0.00	0.00	10,966.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,100.0	0.00	0.00	11,066.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,200.0	0.00	0.00	11,166.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,300.0	0.00	0.00	11,266.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,400.0	0.00	0.00	11,366.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,500.0	0.00	0.00	11,466.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,600.0	0.00	0.00	11,566.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,700.0	0.00	0.00	11,666.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,800.0	0.00	0.00	11,766.4	-662.0	0.0	-661.9	0.00	0.00	0.00
11,800.6	0.00	0.00	11,767.0	-662.0	0.0	-661.9	0.00	0.00	0.00
Sec 21									
11,900.0	0.00	0.00	11,866.4	-662.0	0.0	-661.9	0.00	0.00	0.00
12,000.0	0.00	0.00	11,966.4	-662.0	0.0	-661.9	0.00	0.00	0.00
12,033.6	0.00	0.00	12,000.0	-662.0	0.0	-661.9	0.00	0.00	0.00
12,094.7	7.29	248.11	12,061.0	-663.4	-3.6	-663.3	11.93	11.93	0.00
12,100.0	7.09	252.88	12,066.2	-663.7	-4.2	-663.5	11.93	-3.84	90.26
12,200.0	12.00	325.31	12,165.1	-656.9	-16.1	-656.5	11.93	4.91	72.43
12,300.0	22.82	342.96	12,260.4	-629.7	-27.7	-629.1	11.93	10.82	17.65
12,400.0	34.36	349.38	12,348.1	-583.3	-38.6	-582.5	11.93	11.54	6.41
12,500.0	46.08	352.83	12,424.3	-519.5	-48.4	-518.7	11.93	11.72	3.45
12,600.0	57.87	355.12	12,485.8	-441.3	-56.5	-440.3	11.93	11.79	2.30
12,700.0	69.69	356.89	12,529.9	-352.0	-62.7	-350.9	11.93	11.82	1.76
12,800.0	81.53	358.40	12,554.7	-255.4	-66.6	-254.2	11.93	11.84	1.51
12,871.5	90.00	359.42	12,560.0	-184.1	-68.0	-183.0	11.93	11.84	1.42
Cam121 FTP									
12,900.0	90.00	359.42	12,560.0	-155.7	-68.3	-154.5	0.00	0.00	0.00
13,000.0	90.00	359.42	12,560.0	-55.7	-69.3	-54.5	0.00	0.00	0.00
13,100.0	90.00	359.42	12,560.0	44.3	-70.3	45.5	0.00	0.00	0.00
13,200.0	90.00	359.42	12,560.0	144.3	-71.3	145.5	0.00	0.00	0.00
13,300.0	90.00	359.42	12,560.0	244.3	-72.3	245.5	0.00	0.00	0.00
13,400.0	90.00	359.42	12,560.0	344.3	-73.4	345.5	0.00	0.00	0.00
13,500.0	90.00	359.42	12,560.0	444.3	-74.4	445.5	0.00	0.00	0.00
13,600.0	90.00	359.42	12,560.0	544.3	-75.4	545.5	0.00	0.00	0.00
13,700.0	90.00	359.42	12,560.0	644.3	-76.4	645.5	0.00	0.00	0.00
13,800.0	90.00	359.42	12,560.0	744.3	-77.5	745.5	0.00	0.00	0.00
13,900.0	90.00	359.42	12,560.0	844.3	-78.5	845.5	0.00	0.00	0.00
14,000.0	90.00	359.42	12,560.0	944.3	-79.5	945.5	0.00	0.00	0.00
14,100.0	90.00	359.42	12,560.0	1,044.3	-80.5	1,045.5	0.00	0.00	0.00
14,200.0	90.00	359.42	12,560.0	1,144.3	-81.5	1,145.5	0.00	0.00	0.00
14,300.0	90.00	359.42	12,560.0	1,244.3	-82.6	1,245.5	0.00	0.00	0.00
14,400.0	90.00	359.42	12,560.0	1,344.2	-83.6	1,345.5	0.00	0.00	0.00
14,500.0	90.00	359.42	12,560.0	1,444.2	-84.6	1,445.5	0.00	0.00	0.00
14,600.0	90.00	359.42	12,560.0	1,544.2	-85.6	1,545.5	0.00	0.00	0.00
14,700.0	90.00	359.42	12,560.0	1,644.2	-86.6	1,645.5	0.00	0.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,800.0	90.00	359.42	12,560.0	1,744.2	-87.7	1,745.5	0.00	0.00	0.00
14,900.0	90.00	359.42	12,560.0	1,844.2	-88.7	1,845.5	0.00	0.00	0.00
15,000.0	90.00	359.42	12,560.0	1,944.2	-89.7	1,945.5	0.00	0.00	0.00
15,100.0	90.00	359.42	12,560.0	2,044.2	-90.7	2,045.5	0.00	0.00	0.00
15,200.0	90.00	359.42	12,560.0	2,144.2	-91.7	2,145.5	0.00	0.00	0.00
15,300.0	90.00	359.42	12,560.0	2,244.2	-92.8	2,245.5	0.00	0.00	0.00
15,400.0	90.00	359.42	12,560.0	2,344.2	-93.8	2,345.5	0.00	0.00	0.00
15,500.0	90.00	359.42	12,560.0	2,444.2	-94.8	2,445.5	0.00	0.00	0.00
15,600.0	90.00	359.42	12,560.0	2,544.2	-95.8	2,545.5	0.00	0.00	0.00
15,700.0	90.00	359.42	12,560.0	2,644.2	-96.9	2,645.4	0.00	0.00	0.00
15,800.0	90.00	359.42	12,560.0	2,744.2	-97.9	2,745.4	0.00	0.00	0.00
15,900.0	90.00	359.42	12,560.0	2,844.2	-98.9	2,845.4	0.00	0.00	0.00
16,000.0	90.00	359.42	12,560.0	2,944.2	-99.9	2,945.4	0.00	0.00	0.00
16,100.0	90.00	359.42	12,560.0	3,044.2	-100.9	3,045.4	0.00	0.00	0.00
16,200.0	90.00	359.42	12,560.0	3,144.2	-102.0	3,145.4	0.00	0.00	0.00
16,300.0	90.00	359.42	12,560.0	3,244.2	-103.0	3,245.4	0.00	0.00	0.00
16,400.0	90.00	359.42	12,560.0	3,344.1	-104.0	3,345.4	0.00	0.00	0.00
16,500.0	90.00	359.42	12,560.0	3,444.1	-105.0	3,445.4	0.00	0.00	0.00
16,600.0	90.00	359.42	12,560.0	3,544.1	-106.0	3,545.4	0.00	0.00	0.00
16,700.0	90.00	359.42	12,560.0	3,644.1	-107.1	3,645.4	0.00	0.00	0.00
16,800.0	90.00	359.42	12,560.0	3,744.1	-108.1	3,745.4	0.00	0.00	0.00
16,900.0	90.00	359.42	12,560.0	3,844.1	-109.1	3,845.4	0.00	0.00	0.00
17,000.0	90.00	359.42	12,560.0	3,944.1	-110.1	3,945.4	0.00	0.00	0.00
17,100.0	90.00	359.42	12,560.0	4,044.1	-111.1	4,045.4	0.00	0.00	0.00
17,200.0	90.00	359.42	12,560.0	4,144.1	-112.2	4,145.4	0.00	0.00	0.00
17,300.0	90.00	359.42	12,560.0	4,244.1	-113.2	4,245.4	0.00	0.00	0.00
17,400.0	90.00	359.42	12,560.0	4,344.1	-114.2	4,345.4	0.00	0.00	0.00
17,500.0	90.00	359.42	12,560.0	4,444.1	-115.2	4,445.4	0.00	0.00	0.00
17,600.0	90.00	359.42	12,560.0	4,544.1	-116.2	4,545.4	0.00	0.00	0.00
17,700.0	90.00	359.42	12,560.0	4,644.1	-117.3	4,645.4	0.00	0.00	0.00
17,800.0	90.00	359.42	12,560.0	4,744.1	-118.3	4,745.4	0.00	0.00	0.00
17,900.0	90.00	359.42	12,560.0	4,844.1	-119.3	4,845.4	0.00	0.00	0.00
18,000.0	90.00	359.42	12,560.0	4,944.1	-120.3	4,945.4	0.00	0.00	0.00
18,053.2	90.00	359.42	12,560.0	4,997.2	-120.9	4,998.5	0.00	0.00	0.00
Sec 16									
18,100.0	90.00	359.42	12,560.0	5,044.1	-121.4	5,045.4	0.00	0.00	0.00
18,200.0	90.00	359.42	12,560.0	5,144.1	-122.4	5,145.4	0.00	0.00	0.00
18,300.0	90.00	359.42	12,560.0	5,244.0	-123.4	5,245.4	0.00	0.00	0.00
18,400.0	90.00	359.42	12,560.0	5,344.0	-124.4	5,345.4	0.00	0.00	0.00
18,500.0	90.00	359.42	12,560.0	5,444.0	-125.4	5,445.4	0.00	0.00	0.00
18,600.0	90.00	359.42	12,560.0	5,544.0	-126.5	5,545.4	0.00	0.00	0.00
18,700.0	90.00	359.42	12,560.0	5,644.0	-127.5	5,645.4	0.00	0.00	0.00
18,800.0	90.00	359.42	12,560.0	5,744.0	-128.5	5,745.4	0.00	0.00	0.00
18,900.0	90.00	359.42	12,560.0	5,844.0	-129.5	5,845.4	0.00	0.00	0.00
19,000.0	90.00	359.42	12,560.0	5,944.0	-130.5	5,945.4	0.00	0.00	0.00
19,100.0	90.00	359.42	12,560.0	6,044.0	-131.6	6,045.4	0.00	0.00	0.00
19,200.0	90.00	359.42	12,560.0	6,144.0	-132.6	6,145.4	0.00	0.00	0.00
19,300.0	90.00	359.42	12,560.0	6,244.0	-133.6	6,245.4	0.00	0.00	0.00
19,400.0	90.00	359.42	12,560.0	6,344.0	-134.6	6,345.4	0.00	0.00	0.00
19,500.0	90.00	359.42	12,560.0	6,444.0	-135.6	6,445.4	0.00	0.00	0.00
19,600.0	90.00	359.42	12,560.0	6,544.0	-136.7	6,545.4	0.00	0.00	0.00
19,700.0	90.00	359.42	12,560.0	6,644.0	-137.7	6,645.4	0.00	0.00	0.00
19,800.0	90.00	359.42	12,560.0	6,744.0	-138.7	6,745.4	0.00	0.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,900.0	90.00	359.42	12,560.0	6,844.0	-139.7	6,845.3	0.00	0.00	0.00
20,000.0	90.00	359.42	12,560.0	6,944.0	-140.7	6,945.3	0.00	0.00	0.00
20,100.0	90.00	359.42	12,560.0	7,044.0	-141.8	7,045.3	0.00	0.00	0.00
20,200.0	90.00	359.42	12,560.0	7,143.9	-142.8	7,145.3	0.00	0.00	0.00
20,300.0	90.00	359.42	12,560.0	7,243.9	-143.8	7,245.3	0.00	0.00	0.00
20,400.0	90.00	359.42	12,560.0	7,343.9	-144.8	7,345.3	0.00	0.00	0.00
20,500.0	90.00	359.42	12,560.0	7,443.9	-145.9	7,445.3	0.00	0.00	0.00
20,600.0	90.00	359.42	12,560.0	7,543.9	-146.9	7,545.3	0.00	0.00	0.00
20,700.0	90.00	359.42	12,560.0	7,643.9	-147.9	7,645.3	0.00	0.00	0.00
20,800.0	90.00	359.42	12,560.0	7,743.9	-148.9	7,745.3	0.00	0.00	0.00
20,900.0	90.00	359.42	12,560.0	7,843.9	-149.9	7,845.3	0.00	0.00	0.00
21,000.0	90.00	359.42	12,560.0	7,943.9	-151.0	7,945.3	0.00	0.00	0.00
21,100.0	90.00	359.42	12,560.0	8,043.9	-152.0	8,045.3	0.00	0.00	0.00
21,200.0	90.00	359.42	12,560.0	8,143.9	-153.0	8,145.3	0.00	0.00	0.00
21,300.0	90.00	359.42	12,560.0	8,243.9	-154.0	8,245.3	0.00	0.00	0.00
21,400.0	90.00	359.42	12,560.0	8,343.9	-155.0	8,345.3	0.00	0.00	0.00
21,500.0	90.00	359.42	12,560.0	8,443.9	-156.1	8,445.3	0.00	0.00	0.00
21,600.0	90.00	359.42	12,560.0	8,543.9	-157.1	8,545.3	0.00	0.00	0.00
21,700.0	90.00	359.42	12,560.0	8,643.9	-158.1	8,645.3	0.00	0.00	0.00
21,800.0	90.00	359.42	12,560.0	8,743.9	-159.1	8,745.3	0.00	0.00	0.00
21,900.0	90.00	359.42	12,560.0	8,843.9	-160.1	8,845.3	0.00	0.00	0.00
22,000.0	90.00	359.42	12,560.0	8,943.9	-161.2	8,945.3	0.00	0.00	0.00
22,100.0	90.00	359.42	12,560.0	9,043.8	-162.2	9,045.3	0.00	0.00	0.00
22,200.0	90.00	359.42	12,560.0	9,143.8	-163.2	9,145.3	0.00	0.00	0.00
22,300.0	90.00	359.42	12,560.0	9,243.8	-164.2	9,245.3	0.00	0.00	0.00
22,400.0	90.00	359.42	12,560.0	9,343.8	-165.3	9,345.3	0.00	0.00	0.00
22,500.0	90.00	359.42	12,560.0	9,443.8	-166.3	9,445.3	0.00	0.00	0.00
22,600.0	90.00	359.42	12,560.0	9,543.8	-167.3	9,545.3	0.00	0.00	0.00
22,700.0	90.00	359.42	12,560.0	9,643.8	-168.3	9,645.3	0.00	0.00	0.00
22,800.0	90.00	359.42	12,560.0	9,743.8	-169.3	9,745.3	0.00	0.00	0.00
22,900.0	90.00	359.42	12,560.0	9,843.8	-170.4	9,845.3	0.00	0.00	0.00
23,000.0	90.00	359.42	12,560.0	9,943.8	-171.4	9,945.3	0.00	0.00	0.00
23,100.0	90.00	359.42	12,560.0	10,043.8	-172.4	10,045.3	0.00	0.00	0.00
23,200.0	90.00	359.42	12,560.0	10,143.8	-173.4	10,145.3	0.00	0.00	0.00
Cam121 LTP									
23,283.4	90.00	359.42	12,560.0	10,227.1	-174.3	10,228.6	0.00	0.00	0.00
Cam121 BHL									

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 121H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2951.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**North Reference:**	Grid
Well:	Camellia 121H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Sec 28	0.00	0.00	10,236.0	-5,570.2	-214.7	367,878.13	868,279.00	32° 0' 25.171 N	103° 16' 42.920 W
- plan misses target center by 4914.8usft at 10400.0usft MD (10366.4 TVD, -661.8 N, 0.0 E)									
- Polygon									
Point 1			10,236.0	0.0	0.0	367,878.13	868,279.00		
Point 2			10,236.0	5,283.8	-52.1	373,161.93	868,226.90		
Point 3			10,236.0	5,342.2	5,232.0	373,220.33	873,511.00		
Point 4			10,236.0	60.2	5,286.0	367,938.33	873,565.00		
Sec 21	0.00	0.00	11,767.0	-286.4	-266.9	373,161.95	868,226.87	32° 1' 17.458 N	103° 16' 42.927 W
- plan misses target center by 460.8usft at 11800.6usft MD (11767.0 TVD, -662.0 N, 0.0 E)									
- Polygon									
Point 1			11,767.0	0.0	0.0	373,161.95	868,226.87		
Point 2			11,767.0	5,281.5	-54.5	378,443.45	868,172.37		
Point 3			11,767.0	5,336.0	5,230.6	378,497.95	873,457.47		
Point 4			11,767.0	58.4	5,284.2	373,220.35	873,511.07		
Sec 16	0.00	0.00	11,767.0	4,995.2	-321.4	378,443.47	868,172.36	32° 2' 9.723 N	103° 16' 42.961 W
- plan misses target center by 818.0usft at 18053.2usft MD (12560.0 TVD, 4997.2 N, -120.9 E)									
- Polygon									
Point 1			11,767.0	0.0	0.0	378,443.47	868,172.36		
Point 2			11,767.0	5,280.0	-53.4	383,723.47	868,118.96		
Point 3			11,767.0	5,332.5	5,230.8	383,775.97	873,403.16		
Point 4			11,767.0	54.4	5,285.1	378,497.87	873,457.46		
Cam121 LTP	0.00	0.00	12,560.0	10,177.2	-173.8	383,625.46	868,319.96	32° 3' 0.982 N	103° 16' 40.658 W
- plan misses target center by 33.4usft at 23200.0usft MD (12560.0 TVD, 10143.8 N, -173.4 E)									
- Point									
Cam121 BHL	0.00	0.00	12,560.0	10,227.1	-174.3	383,675.45	868,319.47	32° 3' 1.477 N	103° 16' 40.658 W
- plan hits target center									
- Point									
Cam121 FTP	0.00	0.00	12,560.0	-184.1	-68.0	373,264.16	868,425.77	32° 1' 18.450 N	103° 16' 40.605 W
- plan hits target center									
- Point									

AMEREDEV

Ameredev Operating, LLC.

CAM/AZ
CAM/AZ #1N
Camellia 121H
Wellbore #1

Plan: Design #1

Lease Penetration Section Line Footages

16 January, 2019

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Project	CAM/AZ		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	CAM/AZ #1N				
Site Position:		**Northing:**	373,448.30 usft	**Latitude:**	32° 1' 20.266 N
From:	Lat/Long	**Easting:**	868,493.74 usft	**Longitude:**	103° 16' 39.795 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.56 °

Well	Camellia 121H				
Well Position	**+N/-S** 0.0 usft	**Northing:**	373,448.30 usft	**Latitude:**	32° 1' 20.266 N
	+E/-W 0.0 usft	**Easting:**	868,493.74 usft	**Longitude:**	103° 16' 39.795 W
Position Uncertainty	0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	2,924.0 usft

Wellbore Wellbore #1

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	1/11/2019	6.63	59.90	47,691.06803742

Design Design #1

Audit Notes:

Version:	**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.0	0.0	0.0	359.02

Survey Tool Program **Date** 1/16/2019

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	23,283.4	Design #1 (Wellbore #1)	MWD	OWSG MWD - Standard

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
0.0	0.00	0.00	0.0	283.0	270.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	283.0	270.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	283.0	270.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	283.0	270.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	283.0	270.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	283.0	270.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	283.0	270.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	283.0	270.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	283.0	270.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	283.0	270.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	283.0	270.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	283.0	270.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	283.0	270.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	283.0	270.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	283.0	270.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	283.0	270.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	283.0	270.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	283.0	270.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	283.0	270.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	283.0	270.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	283.0	270.0	0.0	0.00	0.00	0.00
2,100.0	2.00	180.00	2,100.0	281.3	270.0	-1.7	2.00	2.00	0.00
2,200.0	4.00	180.00	2,199.8	276.0	270.0	-7.0	2.00	2.00	0.00
2,300.0	6.00	180.00	2,299.5	267.3	270.0	-15.7	2.00	2.00	0.00
2,400.0	6.00	180.00	2,398.9	256.9	270.0	-26.1	0.00	0.00	0.00
2,500.0	6.00	180.00	2,498.4	246.4	270.0	-36.6	0.00	0.00	0.00
2,600.0	6.00	180.00	2,597.8	235.9	270.0	-47.0	0.00	0.00	0.00

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 121H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2951.0usft
Site:	CAM/AZ #1N	**MD Reference:**	KB @ 2951.0usft
Well:	Camellia 121H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	V. Sec (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
2,700.0	6.00	180.00	2,697.3	225.5	270.0	-57.5	0.00	0.00	0.00
2,800.0	6.00	180.00	2,796.7	215.0	270.0	-67.9	0.00	0.00	0.00
2,900.0	6.00	180.00	2,896.2	204.6	270.0	-78.4	0.00	0.00	0.00
3,000.0	6.00	180.00	2,995.6	194.1	270.0	-88.9	0.00	0.00	0.00
3,100.0	6.00	180.00	3,095.1	183.7	270.0	-99.3	0.00	0.00	0.00
3,200.0	6.00	180.00	3,194.5	173.2	270.0	-109.8	0.00	0.00	0.00
3,300.0	6.00	180.00	3,294.0	162.8	270.0	-120.2	0.00	0.00	0.00
3,400.0	6.00	180.00	3,393.4	152.3	270.0	-130.7	0.00	0.00	0.00
3,500.0	6.00	180.00	3,492.9	141.9	270.0	-141.1	0.00	0.00	0.00
3,600.0	6.00	180.00	3,592.3	131.4	270.0	-151.6	0.00	0.00	0.00
3,700.0	6.00	180.00	3,691.8	121.0	270.0	-162.0	0.00	0.00	0.00
3,800.0	6.00	180.00	3,791.2	110.5	270.0	-172.5	0.00	0.00	0.00
3,900.0	6.00	180.00	3,890.7	100.1	270.0	-182.9	0.00	0.00	0.00
4,000.0	6.00	180.00	3,990.1	89.6	270.0	-193.4	0.00	0.00	0.00
4,100.0	6.00	180.00	4,089.6	79.2	270.0	-203.8	0.00	0.00	0.00
4,200.0	6.00	180.00	4,189.0	68.7	270.0	-214.3	0.00	0.00	0.00
4,300.0	6.00	180.00	4,288.5	58.2	270.0	-224.7	0.00	0.00	0.00
4,400.0	6.00	180.00	4,387.9	47.8	270.0	-235.2	0.00	0.00	0.00
4,500.0	6.00	180.00	4,487.4	37.3	270.0	-245.6	0.00	0.00	0.00
4,600.0	6.00	180.00	4,586.9	26.9	270.0	-256.1	0.00	0.00	0.00
4,700.0	6.00	180.00	4,686.3	16.4	270.0	-266.5	0.00	0.00	0.00
4,800.0	6.00	180.00	4,785.8	6.0	270.0	-277.0	0.00	0.00	0.00
4,900.0	6.00	180.00	4,885.2	-4.5	270.0	-287.4	0.00	0.00	0.00
5,000.0	6.00	180.00	4,984.7	-14.9	270.0	-297.9	0.00	0.00	0.00
5,100.0	6.00	180.00	5,084.1	-25.4	270.0	-308.3	0.00	0.00	0.00
5,200.0	6.00	180.00	5,183.6	-35.8	270.0	-318.8	0.00	0.00	0.00
5,300.0	6.00	180.00	5,283.0	-46.3	270.0	-329.2	0.00	0.00	0.00

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
17.5	13.375	1888	[redacted]	1.76	13.5

Bbl/Sk	0.31372549
bbls	419.402246
Stage Tool Depth	N/A
Top MD of Segment	0
Bottom MD of Segment	1502
Cement Type	C
Additves	Bentonite, Accelerator, Kolseal, Defoamer, Celloflake
Quantity (sks)	1,337
Yield (cu ft/sk)	1.76
Density (lbs/gal)	13.5
Volume (cu ft)	2,352.85
Percent Excess	100%
Column Height	3,389.88

Target % 100% [redacted]

Target TOC	0			
Calc TOC	-1888	bbl	25% Excess	100%
calc vol	0.12372195	233.587041	291.9838012	467.174082

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
17.5	13.375	1888	[redacted]	1.34	14.8

Bbl/Sk	0.23885918
bbls	47.77183601
Top MD of Segment	1502
Bottom MD of Segment	1888
Cement Type	C
Additives	
Quantity (sks)	200
Yield (cu ft/sk)	1.34
Density (lbs/gal)	14.8
Volume (cu ft)	268
Percent Excess	100%
Column Height	386.1225606

SURFACE CEMENT

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	5013	[redacted]	3.5	9

Bbl/Sk	0.623885918
bbls	372.0365733
Stage Tool Depth	N/A
Top MD of Segment	0
Bottom MD of Segment	4163
Cement Type	C
Additves	Bentonite,Salt,Kolseal,Defoamer,Celloclake
Quantity (sks)	596
Yield (cu ft/sk)	3.5
Density (lbs/gal)	9
Volume (cu ft)	2,087.13
Percent Excess	50%
Column Height	6,669.49

Target % 50% [redacted]

Target TOC	0			
Calc TOC	-2506.5	bbl	25% Excess	50%
calc vol	0.055781888	279.6346021	349.5432526	419.4519031

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	5013	[redacted]	1.33	14.8

Bbl/Sk	0.237076649
bbls	47.41532977
Top MD of Segment	4163
Bottom MD of Segment	5013
Cement Type	C
Additives	
Quantity (sks)	200
Yield (cu ft/sk)	1.33
Density (lbs/gal)	14.8
Volume (cu ft)	266
Percent Excess	25%
Column Height	850.013004

INTERMEDIATE 1 CEMENT - STAGE 1

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 2 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	3262	[redacted]	3.5	9

Bbl/Sk				0.623885918	
bbls				225.5254458	
Stage Tool Depth				N/A	
Top MD of Segment				0	
Bottom MD of Segment				2412	
Cement Type				C	
Additves	Bentonite,Salt,Kolseal,Defoamer,Celloclake				
Quantity (sks)				361	
Yield (cu ft/sk)				3.5	
Density (lbs/gal)				9	
Volume (cu ft)				1,265.20	
Percent Excess				50%	Target % 50% [redacted]
Column Height				4,042.99	
	Target TOC	0			
	Calc TOC	-1631	bbl	25% Excess	50%
	calc vol	0.055781888	181.960517	227.4506463	272.9407756

Stage 2 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	3262	[redacted]	1.33	14.8

Bbl/Sk	0.237076649
bbls	47.41532977
Top MD of Segment	2412
Bottom MD of Segment	3262
Cement Type	C
Additives	
Quantity (sks)	200
Yield (cu ft/sk)	1.33
Density (lbs/gal)	14.8
Volume (cu ft)	266
Percent Excess	25%
Column Height	850.013004

INTERMEDIATE 1 CEMENT - STAGE 2

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
8.75	7.625	10670	[redacted]	2.47	9

Bbl/Sk	0.440285205
bbls	168.6309595
Stage Tool Depth	N/A
Top MD of Segment	0
Bottom MD of Segment	6755
Cement Type	H
Additves	Bentonite,Retarder,Kolseal,Defoamer,Celloflake, Anti-Settling
Expansion Additive	
Quantity (sks)	383
Yield (cu ft/sk)	2.47
Density (lbs/gal)	9
Volume (cu ft)	946.02
Percent Excess	25%
Column Height	9,422.97

Target % 25% [redacted]

Target TOC	0			
Calc TOC	-2667.5	bbl	25% Excess	25%
calc vol	0.01789574	190.9475483	238.6844354	238.6844354

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
8.75	7.625	10670	[redacted]	1.31	14.2

Bbl/Sk	0.233511586
bbls	70.05347594
Top MD of Segment	6755
Bottom MD of Segment	10670
Cement Type	H
Additves	Salt,Bentonite,Retarder,Dispersant,Fluid Loss
Quantity (sks)	300
Yield (cu ft/sk)	1.31
Density (lbs/gal)	14.2
Volume (cu ft)	393
Percent Excess	25%
Column Height	3914.533571

INTERMEDIATE 2 CEMENT

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
6.75	5.5	22496	[redacted]	1.34	14.2

Bbl/Sk	0.23885918
bbls	418.2897805
Stage Tool Depth	N/A
Top MD of Segment	0
Bottom MD of Segment	22496
Cement Type	H
Additves	Salt, Bentonite, Fluid Loss, Dispersant, Retarder, Defoamer
Quantity (sks)	1,751
Yield (cu ft/sk)	1.34
Density (lbs/gal)	14.2
Volume (cu ft)	2,346.61
Percent Excess	25%
Column Height	28,120.00

Target % 25% [redacted]

Target TOC	0			
Calc TOC	-5624	bbl	25% Excess	25%
calc vol	0.01487517	334.6318244	418.2897805	418.2897805

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
6.75	5.5	22496	0	0	0

Bbl/Sk	0
bbls	0
Top MD of Segment	22496
Bottom MD of Segment	22496
Cement Type	H
Additives	
Quantity (sks)	0
Yield (cu ft/sk)	0
Density (lbs/gal)	0
Volume (cu ft)	0
Percent Excess	
Column Height	0

PRODUCTION CEMENT

HALLIBURTON

Permian Basin, Ft Stockton

Lab Results- Lead

Job Information

Request/Slurry	2488456/2	**Rig Name**		**Date**	18/DEC/2018
Submitted By	Dillon Briers	**Job Type**	Intermediate Casing	**Bulk Plant**	
Customer	Ameredev	**Location**	Lea	**Well**	

Well Information

Casing/Liner Size	7.625 in	**Depth MD**	5013 ft	**BHST**	165°F
Hole Size	8.75 in	**Depth TVD**	5013 ft	**BHCT**	130°F

Cement Information - Lead Design

Conc	UOM	Cement/Additive
100	% BWOC	NeoCem
14.68	gal/sack	Heated Fresh Water

Cement Properties

Slurry Density	9	lbm/gal
Slurry Yield	3.5	ft3/sack
Water Requirement	14.68	gal/sack

Pilot Test Results Request ID 2488456/1

API Rheology, Request Test ID:35665340

Temp (degF)	300	200	100	60	30	6	3	Cond Time (min)
80 (up)	82	67	49	42	39	36	28	0
80 (down)	82	59	35	26	18	10	9	0
80 (avg.)	82	63	42	34	29	23	19	0

PV (cP) & YP (lbs/100ft2): 61.73 22.32 (Least-squares method)

PV (cP) & YP (lbs/100ft2): 60 22 (Traditional method (300 & 100 rpm based))

Generalized Herschel-Bulkley 4: YP(lbf/100ft2)=20.33 MuInf(cP)=52.39 m=0.81 n=0.81

API Rheology, Request Test ID:35665341

Temp (degF)	300	200	100	60	30	6	3	Cond Time (min)	Cond Temp (degF)
134 (up)	63	47	29	21	15	7	6	30	134
134 (down)	63	46	29	21	14	7	4	30	134
134 (avg.)	63	47	29	21	15	7	5	30	134

PV (cP) & YP (lbs/100ft2): 57.12 7.98 (Least-squares method)

PV (cP) & YP (lbs/100ft2): 51 12 (Traditional method (300 & 100 rpm based))

Generalized Herschel-Bulkley 4: YP(lbf/100ft2)=2.26 MuInf(cP)=30.64 m=0.41 n=0.41

API Fluid Loss, Request Test ID:35665342

Test Temp (degF)	Test Pressure (psi)	Test Time (min)	Meas. Vol.	Calculated FL (<30 min)	Conditioning time (min)	Conditioning Temp (degF)
134	1000	9.12	52	189	30	134

Free Fluid API 10B-2, Request Test ID:35665343

Con. Temp (degF)	Cond. Time (min)	Static T. (F)	Static time (min)	Incl. (deg)	% Fluid
134	30	80	120	0	0

Pilot Test Results Request ID 2504116/5

Thickening Time - ON-OFF-ON, Request Test ID:35852392

Test Temp (degF)	Pressure (psi)	Reached in (min)	70 Bc (hh:min)	Start Bc
126	5800	40	6:18	16

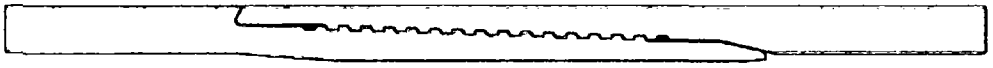
UCA Comp. Strength, Request Test ID:35852394

End Temp (degF)	Pressure (psi)	50 psi (hh:mm)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)	48 hr CS (psi)
159	4000	8:55	12:23	456	749	681

U. S. Steel Tubular Products

6/6/2017 6:18:53 PM

7.625" 29.70lbs/ft (0.375" Wall) HCL80 USS-LIBERTY FJM®



MECHANICAL PROPERTIES	Pipe	USS-LIBERTY FJM®	
Minimum Yield Strength	110,000	--	psi
Maximum Yield Strength	140,000	--	psi
Minimum Tensile Strength	125,000	--	psi
DIMENSIONS	**Pipe**	**USS-LIBERTY FJM®**	
Outside Diameter	7.625	7.625	in.
Wall Thickness	0.375	--	in.
Inside Diameter	6.875	6.789	in.
Standard Drift	6.750	6.750	in.
Alternate Drift	--	--	in.
Nominal Linear Weight, T&C	29.70	--	lbs/ft
Plain End Weight	29.06	--	lbs/ft
SECTION AREA	**Pipe**	**USS-LIBERTY FJM®**	
Critical Area	8.541	5.074	sq. in.
Joint Efficiency	--	59.4	%
PERFORMANCE	**Pipe**	**USS-LIBERTY FJM®**	
Minimum Collapse Pressure	6,700	6,700	psi
Minimum Internal Yield Pressure	9,460	9,460	psi
Minimum Pipe Body Yield Strength	940,000	--	lbs
Joint Strength	--	558,000	lbs
Compression Rating	--	558,000	lbs
Reference Length	--	12,810	ft
Maximum Uniaxial Bend Rating	--	39.3	deg/100 ft
Make-Up Loss	--	3.92	in.
Minimum Make-Up Torque	--	10,800	ft-lbs
Maximum Make-Up Torque	--	15,250	ft-lbs

1. Other than proprietary collapse and connection values, performance properties have been calculated using standard equations defined by API 5C3 and do not incorporate any additional design or safety factors. Calculations assume nominal pipe OD, nominal wall thickness and Specified Minimum Yield Strength (SMYS).
2. Compressive & Tensile Connection Efficiencies are calculated by dividing the connection critical area by the pipe body area.
3. Uniaxial bending rating shown is structural only, and equal to compression efficiency.
4. USS-LIBERTY FJM™ connections are optimized for each combination of OD and wall thickness and cannot be interchanged.
5. Torques have been calculated assuming a thread compound friction factor of 1.0 and are recommended only. Field make-up torques may require adjustment based on actual field conditions (e.g. make-up speed, temperature, thread compound, etc.).
6. Reference length is calculated by joint strength divided by nominal plain end weight with 1.5 safety factor.
7. *Connection external pressure leak resistance has been verified to 100% API pipe body collapse pressure following the guidelines of API 5C5 Cal III.*

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064

1-877-893-9461
connections@uss.com
www.usstubular.com

U. S. Steel Tubular Products

5 1/2 20.00 lb (0.361) P110 HP — USS-EAGLE SFH™

	PIPE	CONNECTION	
MECHANICAL PROPERTIES			
Minimum Yield Strength	**125,000**	**125,000**	*psi*
Maximum Yield Strength	**140,000**	**140,000**	*psi*
Minimum Tensile Strength	**130,000**	**130,000**	*psi*
DIMENSIONS			
Outside Diameter	**5.500**	**5.830**	*in.*
Wall Thickness	0.361		*in.*
Inside Diameter	4.778	4.693	*in.*
Drift - API	4.653	4.653	*in.*
Nominal Linear Weight, T&C	**19.83**		*lbs/ft*
Plain End Weight	19.83	19.83	*lbs/ft*
SECTION AREA			
Cross Sectional Area | Critical Area	5.828	5.054	*sq. in.*
Joint Efficiency		86.25	%
PERFORMANCE			
Minimum Collapse Pressure	13,150	13,150	*psi*
External Pressure Leak Resistance		10,000	*psi*
Minimum Internal Yield Pressure	14,360	14,360	*psi*
Minimum Pipe Body Yield Strength	729,000		*lbs*
Joint Strength		631,750	*lbs*
Compression Rating		631,750	*lbs*
Reference Length		21,240	*ft*
Maximum Uniaxial Bend Rating		89.9	*deg/100 ft*
Minimum Make-Up Torque		14,000	*ft-lbs*
Maximum Make-Up Torque		16,900	*ft-lbs*
Maximum Operating Torque		25,000	*ft-lbs*
Make-Up Loss		5.92	*in.*

Notes:

1) Other than proprietary collapse and connection values, performance properties have been calculated using standard equations defined by API 5C3 and do not incorporate any additional design or safety factors. Calculations assume nominal pipe OD, nominal wall thickness, and Specified Minimum Yield Strength (SMYS).
2) Compressive & Tensile Connection Efficiencies are calculated by dividing the connection critical area by the pipe body area.
3) Uniaxial bending rating shown is structural only, and equal to compression efficiency.
4) Torques have been calculated assuming a thread compound friction factor of 1.0 and are recommended only. Field make-up torques may require adjustment based on actual field conditions (e.g. make-up speed, temperature, thread compound, etc.).
5) Reference length is calculated by joint strength divided by plain end weight with 1.5 safety factor.
6) Connection external pressure resistance has been verified to 10,000 psi (Application specific testing).

Manuel USS Product Data Sheet 2017 rev25 (April)

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064
1-877-893-9461
connections@uss.com
www.usstubular.com

Continental
CONTITECH

QUALITY CONTROL	No.: QC-DB- 651 / 2013
	Page : 1 / 44
Hose No.: 66551, 66552, 66553, 66554	Revision : 0
	Date: 14. November 2013.
	Prepared by :
	Appr. by:

CHOKE AND KILL HOSES

id.: 3" 69 MPa x 35 ft (10,67 m)

DATA BOOK

Purchaser: H&P STOCK

Purchaser Order No.:

ContiTech Rubber Order No.: 537587

ContiTech Oil & Marine Corp. Order No.: 4500370505

NOT DESIGNED FOR WELL TESTING

CONTENT

ContiTech Rubber
Industrial Kft.
Quality Control Dept.
(1)

QMS REGISTERED

Certificate of Registration

APIQR REGISTRATION NUMBER

0760

This certifies that the quality management system of

CONTITECH RUBBER INDUSTRIAL LTD.
Budapesti ut 10
Szeged
Hungary

has been assessed by the American Petroleum Institute Quality Registrar (APIQR®) and found it to be in conformance with the following standard:

ISO 9001:2008

The scope of this registration and the approved quality management system applies to the

Design and Manufacture of High Pressure Hoses

APIQR® approves the organization's justification for excluding:

No Exclusions Identified as Applicable

Effective Date: October 15, 2013
Expiration Date: October 15, 2016
Registered Since: October 15, 2007

W. Dan Whittaker
Manager of Operations, APIQR

Accredited by Member of the International Accreditation Forum Multilateral Recognition Arrangement for Quality Management Systems

ANAB IAF

This certificate is valid for the period specified herein. The registered organization must continually meet all requirements of APIQR's Registration Program and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. Further clarifications regarding the scope of this certificate and the applicability of ISO 9001 standard requirements may be obtained by consulting the registered organization. This certificate has been issued from APIQR offices located at 1220 L Street, N.W., Washington, D.C. 20005-4070, U.S.A. It is the property of APIQR, and must be returned upon request. To verify the authenticity of this certificate, go to www.api.org/compositelist.

QUALITY REGISTRAR

Certificate of Authority to use the Official API Monogram

License Number: 16C-0004 **ORIGINAL**

The American Petroleum Institute hereby grants to

CONTITECH RUBBER INDUSTRIAL LTD.
Budapesti ut 10
Szeged
Hungary

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API Spec 16C** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: **16C-0004**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following product: Flexible Choke and Kill Lines

QMS Exclusions: No Exclusions Identified as Applicable

American Petroleum Institute

Effective Date: OCTOBER 15, 2013
Expiration Date: OCTOBER 15, 2016

To verify the authenticity of this license, go to www.api.org/compositelist.

Director of Global Industry Services

American Petroleum Institute

AMERICAN PETROLEUM INSTITUTE CORPORATE SEAL INCORPORATED 1919

2011-1-2

CONTITECH RUBBER Industrial Kft. | No:QC-DB- 651 /2013 | Page: 4 / 44

Continental CONTITECH

CONTITECH RUBBER Industrial Kft.	No:QC-DB- 651 /2013
	Page: 5 / 44

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°: 1905
PURCHASER: ContiTech Oil & Marine Corp.					P.O. N°: 4500370505
CONTITECH RUBBER order N°: 537587		HOSE TYPE: 3" ID		Choke and Kill Hose	
HOSE SERIAL N°: 66551		NOMINAL / ACTUAL LENGTH:		10,67 m / 10,75 m	
W.P. 68,9 MPa 10000 psi		T.P. 103,4 MPa 15000 psi		Duration: 60 min.	

Pressure test with water at
ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°
3" coupling with	8084	8083	AISI 4130	24613
4 1/16" 10K API Flange end			AISI 4130	034939

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

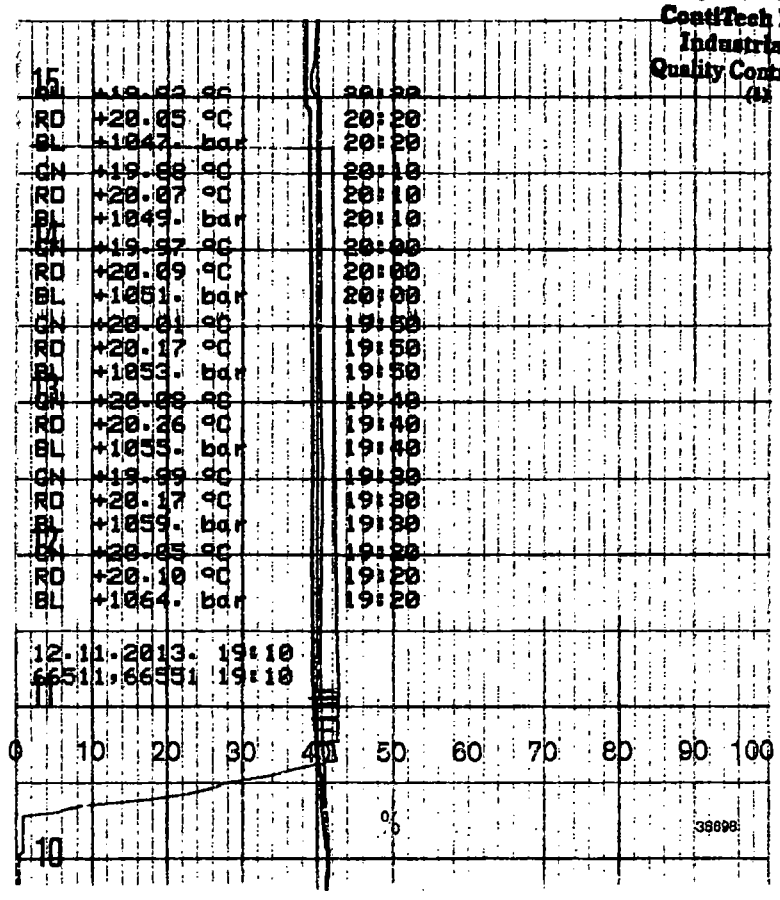
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept.

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE *No: 1904, 1905*

CoastTech Rubber Industrial Kft.
Quality Control Dept.



Continental CONTITECH

CONTITECH RUBBER Industrial Kft.	No:QC-DB- 651 /2013
	Page: 6 / 44

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°: 1906
PURCHASER: ContiTech Oil & Marine Corp.					P.O. N°: 4500370505
CONTITECH RUBBER order N°: 537587			HOSE TYPE: 3" ID		Choke and Kill Hose
HOSE SERIAL N°: 66552			NOMINAL / ACTUAL LENGTH:		10,67 m / 10,73 m
W.P. 68,9 MPa	10000 psi		T.P. 103,4 MPa	15000 psi	Duration: 60 min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°
3" coupling with	8088	8085	AISI 4130	24613
4 1/16" 10K API Flange end			AISI 4130	034939

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

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COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept.

Continental CONTITECH

CONTITECH RUBBER Industrial Kft.	No:QC-DB- 651 /2013
	Page: 7 / 44

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE

CERT. N°: 1907

PURCHASER:	ContiTech Oil & Marine Corp.	P.O. N°:	4500370505
CONTITECH RUBBER order N°:	537587	HOSE TYPE:	3" ID Choke and Kill Hose
HOSE SERIAL N°:	66553	NOMINAL / ACTUAL LENGTH:	10,67 m / 10,745 m

W.P.	68,9	MPa	10000	psi	T.P.	103,4	MPa	15000	psi

Duration: 60 min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°	
3" coupling with	8089	8087	AISI 4130	23171	24613
4 1/16" 10K API Flange end			AISI 4130	034939	

NOT DESIGNED FOR WELL TESTING

API Spec 16 C

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

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COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept.

Continental CONTITECH

CONTITECH RUBBER Industrial Kft.	No:QC-DB- 651 /2013
	Page: 8 / 44

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°: 1908
PURCHASER: ContiTech Oil & Marine Corp.					P.O. N°: 4500370505
CONTITECH RUBBER order N°: 537587		HOSE TYPE: 3" ID		Choke and Kill Hose	
HOSE SERIAL N°: 66554		NOMINAL / ACTUAL LENGTH:		10,67 m / 10,71 m	
W.P. 68,9 MPa	10000 psi	T.P. 103,4 MPa	15000 psi	Duration: 60	min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°	
3" coupling with	8090	8086	AISI 4130	23171	24613
4 1/16" 10K API Flange end			AISI 4130	034939	

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

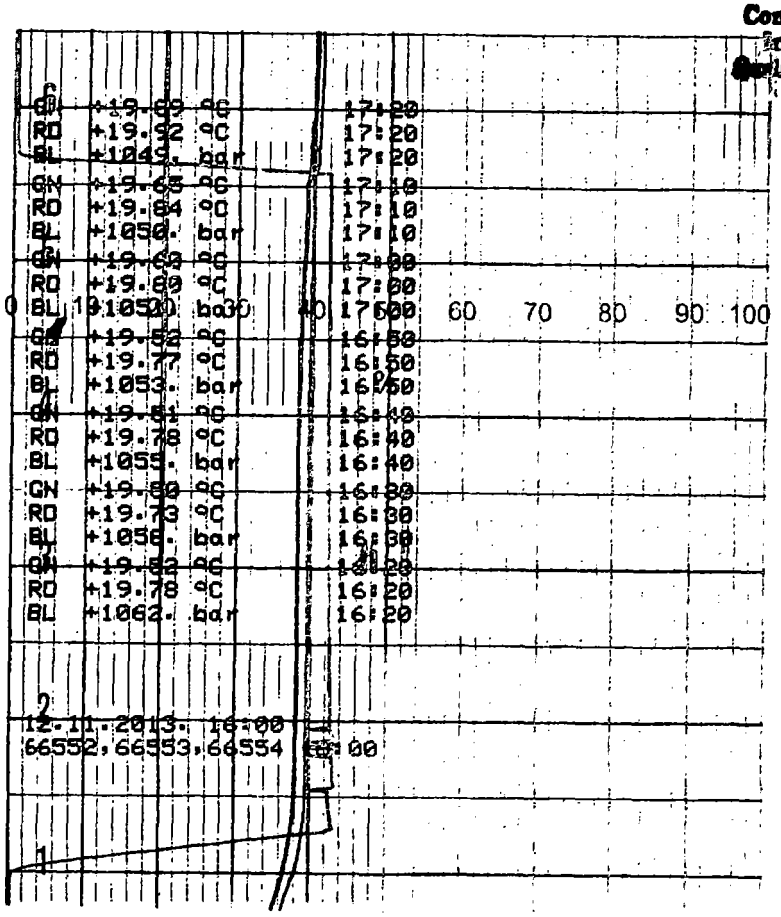
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept.

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE *No:1906, 1907, 1908*

ContiTech Rubber
Industrial Kft.
Quality Control Dept.
(1)



Continental CONTITECH

Hose Data Sheet

CRI Order No.	537587
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500370505
Item No.	1
Hose Type	Flexible Hose
Standard	**API SPEC 16 C**
Inside dia in inches	3
Length	35 ft
Type of coupling one end	FLANGE 4.1/16" 10KPSI API SPEC 6A TYPE 6BX FLANGE C/W BX155STANDARD RING GROOVE
Type of coupling other end	FLANGE 4.1/16" 10KPSI API SPEC 6A TYPE 6BX FLANGE C/W BX155 STANDARD RING GROOVE
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	USUAL PHOENIX
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL RESISTANT
Safety clamp	No
Lifting collar	No
Element C	No
Safety chain	No
Safety wire rope	No
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15

Body

8083 - 8088

Customer:	ContiTech Rubber Industrial Kft
Order Number:	32258500
Part Number:	4205160045
Our Ref:	SO64201
Date:	11th February 2013
Certificate Number:	TR070687 (Rev. 18/06/2013)
Approved Signatories:	R M Greaves A Cocking J Jarvis A Pears S Selman

TM steels

3451 - 3466

4205160045

CERTIFICATE OF CONFORMITY

Description	Heat Treatment
AISI4130 BLACK ROLLED BAR, HEAT TREATED & TESTED TO 197-238 BHN, 655MPA MIN TENSILE, 517MPA MIN YIELD, 18% MIN ELONGATION, CHARPY IMPACT TESTING 27J MIN @ -30C (OR COLDER) LATERAL EXPANSION 0.38 MIN, ROLLING REDUCTION 3:1 MIN, NI 1% MAX & CE 0.82 MAX, TESTS MAY BE TAKEN FROM A 4" SQR QTC AS PER API 6A/PSL 3 QTC SIZE. MECHANICAL TEST SPECIMEN TO ASTM A370 NACE MR0175/ISO15156 APPLIES APPROX 20 TONNES 210 MM DIA CERTS TO EN10204 3.1	HARDENED FROM 860°C FOR 5:30 HOURS (WATER QUENCH) TEMPERED AT 670°C FOR 10 HOURS (AIR COOL) WATER TEMPERATURE BEFORE QUENCH, 28°C, AFTER, 35°C. TEMP. MEASUREMENT, FURNACE ATMOSPHERE THERMOCOUPLE COMPONENT HARDNESS E10 - 211 HBW10/3000 TEST COUPON - 4" SQ X 8" LONG, TESTED AT ¼ T LOCATION REDUCTION RATIO - 6,2 REDUCTION RATIO & HT APPLY TO BOTH JOB & TEST PIECE FURNACE CALIBRATION: API6A 20th ed, annex M C/E = 0.693

CAST 24613

C	Si	Mn	S	P	Ni	Cr	Mo	Al	Cu	Sn	Nb
0.3200	0.2590	0.5680	0.0090	0.0100	0.1660	1.0560	0.2350	0.0200	0.1420	0.0070	0.0010
V	**Ta**	**Ti**	**Nb+Ta**	**Co**	**N**	**B**	**W**	**Ce**	**Fe**	**As**	**Sb**
0.0010		0.0010			0.0079	0.0001					
Pb	**Ca**	**H (ppm)**	**CEV**								
		1.20	0.69								

TEST SPECIFICATION 517 N/mm2 MIN YIELD

Temperature	Re	Rp 0.2	Rm	A %	Z %	Impact	Temp.	Hardness
RT		517.000						
	N/mm2	N/mm2	N/mm2	4d				

TEST RESULTS

Test Number	Dir./Temp.	Re	Rp	Rm	A %	Z %	Joules	Charpy Direction	
					G/L 50.00mm				HBW10/3000
ST22561N	20.0°C		524.000	698.000	27.60	67.70	KCV -46°C 60 50 78	LONG	211
Specimen Ø 12.500mm							KCV -60°C 50 50 46	LONG	
							% Shear Surface 62.0% 52.0% 60.0%		
							Lateral Expansion (mm) 0.840 0.740 1.020	LONG	

ContiTech Rubber Industrial Kft. CERTIFICATE ACCEPTABLE
QC INSPECTOR
DATE: 14.06.21.

For and on Behalf of TM Steels Ltd. A Cocking

TM Steels Ltd
Foxwood Way
Foxwood Road
Chesterfield

Tel +44 (0)1246 268312
Sales Fax +44 (0)1246 268313

ook Street
ield S9 2JN
hone: +44 114 244 6711
nile: +44 114 244 7469

Body
8089 - 8090

Test Certificate

		Customer Order Number	32252193 - 01
		Customer Order Date	27Feb12
		Sales Order Number	EUR-352067-1
		Report Date	25Sep12
		Quantity	14 Pcs 17402 Kgs 210 mm Dia

To:
CONTITECH RUBBER INDUSTRIAL KFT
H-6728,
SZEGED,
BUDAPESTI UT 10, K 1562 - K 1575
HUNGARY,
HUNGARY
420516 0045

Test Number	402483
Part Number	4205160045
Cast Number	23171
Cert Number	EUR-265844

Description AISI 4130 75KSI .2% PS API QTC — Steel Type: ALLOY 4130

quoted only refer to the items tested.

d Specification	AISI4130				
eatment Spec	197-237BHN	Test Spec	517N/MM2MIN.YLD	Test Spec	
actice	EF/VD	Production Method	FORGED		

ust Treatment	Temp(°C)	Soak	Coolant	Charge Ref.	Init	Max(°C)	Batch
N	860	3 HRS	WATER QUENCH	SHF-158284	20	30	0912091308
R	650	4 HRS	TABLE COOL	SHF-158284			1012091319

Temp recorded using: CONTACT THERMOCOUPLE
Nature of T/P: Separate
Qtc size: 4inch SQ X 6inch LONG

	Req. Min/Max			Achieved		
Hardness on T/P	197	237	HBW	229	229	HBW
Hardness on Material	197	237	HBW	218	235	HBW

Impacts -

ocation	Direction	Rp 0.20%	Rm	A%	Z%	Location	Direction	CVN	Lat. Exp. (mm)	% Shear
1/4T	LONGITUDINAL	517 Min	655 to 800	18 Min (4d)	0 Min	1/4T	LONGITUDINAL	27 Min Ave	0.380 Min	0
(N/mm2)		580	765	25 (50.0mm)	64.0 (12.56mm)	Results (Joules)	-30 Centigrade	106 104 102	1.44 1.42 1.4	40 40 40
						Results				

n																									
lesistance			Ferrite										Microstructure												
Equivalent				.871					Grain Size				Min	6	Max	6									
Si	Mn	P	S	Cr	Mo	Ni	Cu																		
0.2920	0.5370	0.0110	0.0050	1.0620	0.2290	0.1660	0.2430																		

BSEN10204.2004 3.1
R-01-75
TION RATIO 6.5:1

ContiTech Rubber Industrial Kft. CERTIFICATE ACCEPTABLE
QC INSPECTOR
DATE: 12.10.04

All furnace Calibration conforms to API6A 20th Edition ANNEX M.
Hardness load/penetration depth - HBW 10 diameter (mm)/3000 kgf test force per ASTM E10.

Third party inspection :

Signature

CONTITECH RUBBER Industrial Kft. No:QC-DB- 651 /2013
Page: 11 / 44

Flange

HAMOR zRt.

8083-8090 3386 4205140284

FORGING, MACHINING, HEAT-TREATING

ÉMI-TÜV ISO9001

H-3531 Miskolc, Kiss Ernő u. 17. Phone: 36/46/401-033 Fax: 36/46/379-199

INSPECTION CERTIFICATE

ACCEPTANCE ACCORDING EN 10204-05/3.1 | Certificate No.: 86989/13-0

Date of issue: 2013.03.27 | Hámor No.: **98-39B5263** | Order No.: 32259784/13/2

Customer: **Contitech Rubber Industrial Kft.**
6728 Szeged Budapesti út 10

Quality: **AISI 4130/CONTI** Spec.No.: **API 6A PSL3** 325/151 × 182
Dimension: **MSO-100597-002/A/H** mm
Final dim.:**MSO-100597-002/A(4 1/16")** Heat-treatment:Quenched & tempered

Quantity: **30** pcs | Weight: **73.0** kg/pc | Total weight: **2190.00** kg

nomination of product: **Forged,machined disc**

Chemical analysis %

Heat No.: 034939
Steelmaker: **CELSA Hutaostrowiec POLA**

Test No.		C	MN	SI	P	S	CR	MO	V	Ce
	Spec. value Min.									
	Max.	0.45	1.80	1.00	0.025	0.025	2.75	1.500	0.300	0.82
	Result	0.28	0.56	0.20	0.006	0.003	0.99	0.170	0.003	0.62

Mechanical properties:

Test No.		HB	Rp0.2 MPa	Rm MPa	A5 %	KV-J -30°C
	Spec. value Min.	197	517	655	18	27
	Max.	238				
	Result	235 238				
L13314	Result		525	662	19.50	35 52 82

ContiTech Rubber Industrial Kft. CERTIFICATE ACCEPTABLE QC INSPECTOR DATE: 11.01.29

Test bar from product.
Dimensional and visual control: passed
Ultrasonic test acc. to SEP 1921-84 spec. is satisfactory C/c
Steel making (melting) process: UHP-ASEA vacuum-treated.
NACE MR 0175/ISO 15156+API 17K + API 6A PSL3.
HB-E10,Mechanika:ASTM A370 acc.
Grade Of forging: 9.81 30 pc/series.

Executive

Hámor zRt. minőség ellenőrzés

Expert

HÁMOR ZRt.
MISKOLC Kiss Ernő u. 17. sz. H-3531 tel:36/46/401-033 fax:36/46/379-199 e-mail: hamor@t-online.hu

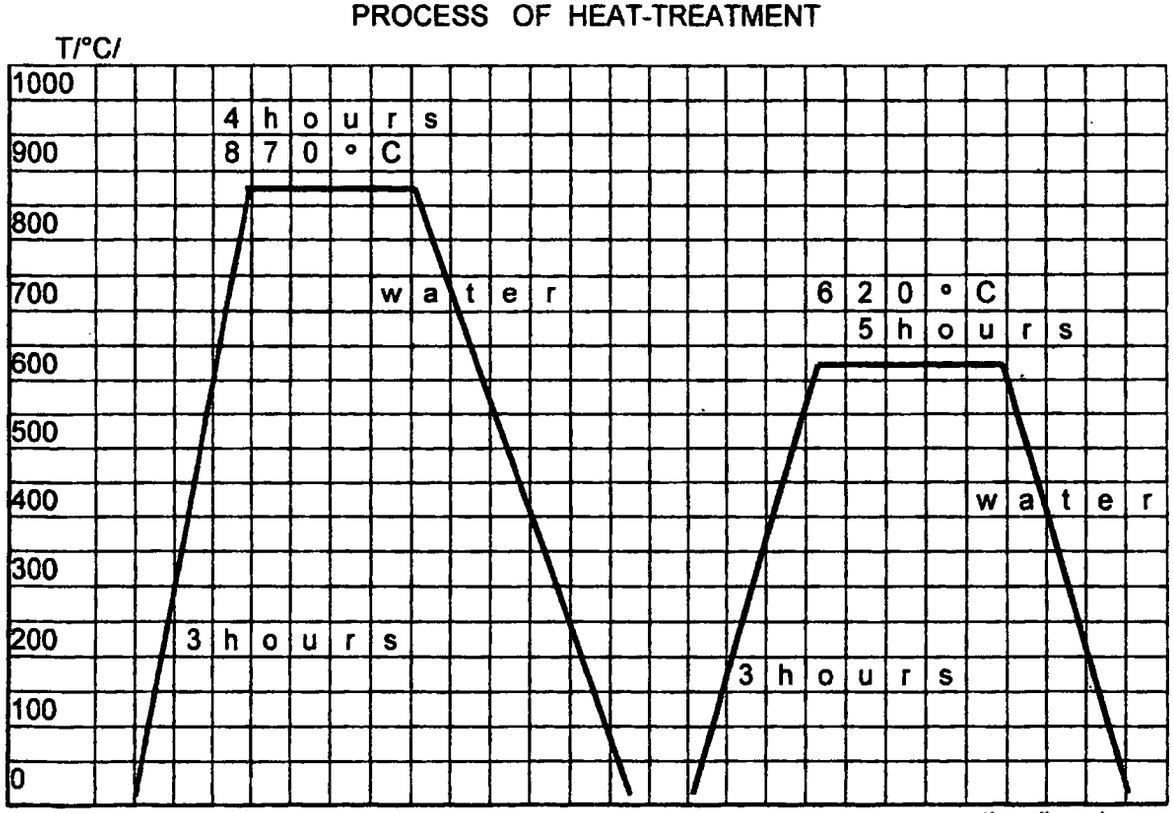
PROTOCOL NUMMER: 98-39B5263

HEAT-TREATMENT PROTOCOL

BUYER: CONTITECH RUBBER INDUSTRIAL Kft. Szeged Budapesti út 10. sz.	Order No. of Buyer: 32259784/13/2	
	Work No. of Buyer:	
PRODUCT: forged	QUANTITY: PIECE 30	No. of drawing: MSO-100597-002/A/H
MATERIAL QUALITY: AISI 4130 CONTI API 6A PSL3	Charge No.: 34939	Test No.:

HEAT-TREATMENT: quenching and tempering
Typ of furnace: electric furnace Hardening medium: water

PROCESS OF HEAT-TREATMENT



Miskolc, Hámor ZRt. 2013-03-26.

Kanó
head of heat-treatment

Hám

Felado : 61344 gamma controll kft 19/10/13 12:54 Lap: 2

GAMMA-CONTROLL	HARDNESS TEST REPORT	Report No: 561/13.

CLIENT: JE-ZO KFT. SZEGED, KÜLTERÜLET, 01408/22.

TEST EQUIPMENT: TH 160-D Hardness tester

PROCEDURE: QCP-45-R1

DESCRIPTION OF COUPLING: coupling(s) after PWHT

DRAWING NUMBER: MT-3121-3000

SERIAL NUMBER: 8083; 8084; 8085; 8086

BRINELL HARDNESS REQUIREMENT	SERIAL NO OF COUPLING	PART OF THE COUPLING	ACTUAL HARDNESS RESULT (HB)
Min HB 197 Max HB 238	✓ 8083	body	224
		weld	222
		flange	236
		connection face	238
	✓ 8084	body	213
		weld	208
		flange	220
		connection face	238
	✓ 8085	body	214
		weld	214
		flange	219
		connection face	222
	✓ 8086	body	232
		weld	237
		flange	238
		connection face	197

The coupling(s) conform to API Spec 6A requirements.

DATE:	PREPARED:	APPROVED:
2013. október 30.	Ménesi István	GAMMA - CONTROLL KFT. 6750 Algyő, Külterület 0188/14. hrsz Adószám: 11094574-2-06 www.gamma-controll.hu Gamma Nikolai

QCP-03 HB/11

Felado : 61344 gamma controll kft 19/10/13 12:54 Lap: 3

GAMMA-CONTROLL	HARDNESS TEST REPORT	Report No: 562/13.

CLIENT:	JE-ZO KFT. SZEGED, KÜLTERÜLET, 01408/22.
TEST EQUIPMENT:	TH 160-D Hardness tester
PROCEDURE:	QCP-45-R1
DESCRIPTION OF COUPLING:	coupling(s) after PWHT
DRAWING NUMBER:	MT-3121-3000
SERIAL NUMBER:	8087; 8088; 8089; 8090

BRINELL HARDNESS REQUIREMENT	SERIAL NO OF COUPLING	PART OF THE COUPLING	ACTUAL HARDNESS RESULT (HB)
Min HB 197 Max HB 238	✓ 8087	body	213
		weld	216
		flange	220
		connection face	225
	✓ 8088	body	229
		weld	212
		flange	223
		connection face	213
	✓ 8089	body	219
		weld	229
		flange	231
		connection face	238
	✓ 8090	body	207
		weld	210
		flange	226
		connection face	234

The coupling(s) conform to API Spec 6A requirements.

DATE:	PREPARED:	APPROVED:
2013. október 30.	Ménesi István	GAMMA CONTROLL KFT. 6750 Algyő, Külterület 01484/14. hrsz. Adószám: 11094014-2-06 www.gammacontroll.hu Varga Mihály

QCP-03 HB/11

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, külterület 01884/14. hrsz.
Tel./Fax.: +36 62/517-400 / 61344
A NAT által MAT-1-1143/2010 számon akkreditált vizsgálólaboratórium

ULTRAHANG VIZSGÁLATI JEGYZŐKÖNYV

ULTRASONIC EXAMINATION REPORT

Vizsgálati szám:
Report No.: 513/13

Vizsgálat tárgya / Object of test

Coupling (Body)

Gyártó Manufacturer		Megrendelő Customer	JE-ZO Kft. Szeged
Gyáriszám Serial-No.		Rendelési szám Order-No.	—
Azonosító jel Identification	8083-8088	Követelmény Requirement	ASTM A388
Geometriai kialakítás / Rajzszám Geometric configuration / Drawing-No. MT-3121-3000	ø200xø70x491	Vizsgálati hőkezelés Test heat treatment	előtt prior
Anyagminőség Material	AISI 4130 ✓	Letapogatási irányok Direction of scanning	axiális és radiális
Adagszám Heat-No.	24613 ✓		
Vizsgálati felület állapota Surface condition	forgácsolt machined	Vizsgálati terjedelem Exted of Test	100%
Vizsgált darabszám Testing pieces	6 db		

Vizsgálati adatok / Examination data

Készülék típusa Type of US-equipment	USM25	Készülék gyári száma Serial-No. Of US-equipment	7875f
Vizsgálófej(ek) Searc unit(s)	SEB-2, SEB4H	Frekvencia(k) Frequency(ies)	2 MHz 4 MHz MHz MHz
Kalibrációs blokk Calibration standard identfication	ET1,ET2	Erősítés(ek) Gain	axiálisan 18 dB dB dB radiálisan 6 dB
Csatoló közeg Couplant	olaj oil	Hanggyengülés Attenuation	dB/m

Értékelés / észlelt kijelzések / Evaluation / recordable indications

Értékelés Evaluation	X	megfelelő satisfactory		nem megfelelő / not acceptable

Megjegyzés(ek)
Remark(s)

Hely / kelt Place / date Gamma-Controll Kft. Algyő, 2013.10.17	Vizsgálatot végezte Tested by Tóth Ákos UT20103090307	GAMMA-CONTROLL KFT. 6750 Algyő, külterület 01884/14. hrsz. Adószám: 11094614-2-06 www.gamma-controll.hu Tel.: 06-30-218-2640 Jóváhagyta Approved by Benkő Péter - Felelős vezetőh.

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, külterület 01884/14. hrsz.
Tel./Fax.: +36 62/517-400 / 61344
A NAT által NAT-1-1140/2010 számon akkreditált vizsgálólaboratórium

ULTRAHANG VIZSGÁLATI JEGYZŐKÖNYV

ULTRASONIC EXAMINATION REPORT

Vizsgálati szám:
Report No.: 514/13

Vizsgálat tárgya / Object of test

Coupling (Body)

Gyártó Manufacturer		Megrendelő Customer	JE-ZO Kft. Szeged
Gyáriszám Serial-No.		Rendelési szám Order-No.	---
Azonosító jel Identification	8089-8090	Követelmény Requirement	ASTM A388
Geometriai kialakítás / Rajzszám Geometric configuration / Drawing-No. MT-3121-3000	ø200xø70x491	Vizsgálati hőkezelés Test heat treatment	előtt prior
Anyagminőség Material	AISI 4130 /	Letapogatási irányok Direction of scanning	axiális és radiális
Adagszám Heat-No.	23171 /		
Vizsgálati felület állapota Surface condition	forgácsolt machined	Vizsgálati terjedelem Exted of Test	100%
Vizsgált darabszám Testing pieces	2 db		

Vizsgálati adatok / Examination data

Készülék típusa Type of US-equipment	USM25	Készülék gyári száma Serial-No. Of US-equipment	7875f
Vizsgálófej(ek) Searc unit(s)	SEB-2, SEB4H	Frekvencia(k) Frequency(ies)	2 MHz 4 MHz MHz MHz
Kalibrációs blokk Calibration standard identfication	ET1,ET2	Erősítés(ek) Gain	axiálisan 18 dB dB dB radiálisan 6 dB
Csatoló közeg Couplant	olaj oil	Hanggyengülés Attenuation	dB/m

Értékelés / észlelt kijelzések / Evaluation / recordable indications

Értékelés Evaluation	X	megfelelő satisfactory		nem megfelelő / not acceptable

Megjegyzés(ek)
Remark(s)

Hely / kelt Place / date		
Gamma-Controll Kft. Algyő, 2013.10.17	Vizsgálatot végezte Tested by Tóth Ákos UT20103090307	GAMMA - CONTROLL KFT. 6750 Algyő, Külterület 01884/14. hrsz. Adószám: 2-06 www.gamma-controll.hu Tel.: 06-62/518-2640 Approved by Benkő Péter - Felelős vezető

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, Ipartelepi út 0384/14. hrsz
Tel./Fax.: +36 62/512-400 / 61384

ULTRAHANG VIZSGÁLATI JEGYZŐKÖNYV

ULTRASONIC EXAMINATION REPORT

Vizsgálati szám: Report No.: **516/13**

Vizsgálat tárgya / Object of test — Flange

Gyártó / Manufacturer		Megrendelő / Customer	JE-ZO Kft. Szeged
Gyáriszám / Serial-No.		Rendelési szám / Order-No.	---
Azonosító jel / Identification	8083-8090	Követelmény / Requirement	ASTM A388
Geometriai kialakítás / Rajzszám / Geometric configuration / Drawing-No.	MT-3121-3000 ø315x85xø190x94xø70	Vizsgálati hőkezelés / Test heat treatment	előtt / prior
Anyagminőség / Material	AISI 4130 /	Letapogatási irányok / Direction of scanning	axiális és radiális
Adegszám / Heat-No.	034939 /		
Vizsgálati felület állapota / Surface condition	forgácsolt / machined	Vizsgálati terjedelem / Extend of Test	100%
Vizsgált darabszám / Testing pieces	8 db		

Vizsgálati adatok / Examination data

Készülék típusa / Type of US-equipment	USM25	Készülék gyári száma / Serial-No. Of US-equipment	7875f
Vizsgálófej(ek) / Searc unit(s)	SEB-2, SEB4H	Frekvencia(k) / Frequency(ies)	2 MHz 4 MHz MHz MHz
Kalibrációs blokk / Calibration standard identification	ET1,ET2	Erősítés(ek) / Gain — axiálisan	6 dB dB dB
		radiálisan	6 dB
Csatoló közeg / Couplant	olaj / oil	Hanggyengulés / Attenuation	dB/m

Értékelés / észlelt kijelzések / Evaluation / recordable indications

Értékelés / Evaluation	X	megfelelő / satisfactory		nem megfelelő / not acceptable

Megjegyzés(ek) / Remark(s)

Hely / kelt / Place / date		
Gamma-Controll Kft. Algyő, 2013.10.17	Vizsgálatot végezte / Tested by	Jóváhagyta / Approved by
	Tóth Ákos UT20103090307	Benkő Péter - Felelős vezető

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **UT20103090307**

A tanúsított neve: (The name and forename of the certificated individual): *Tóth Ákos József*

Születési hely/idő: (Place and date of birth): *Hódmezővásárhely, 1987. 09. 19.*

A tanúsított személy aláírása (The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): *Ultrahangos anyagvizsgálat (Ultrasonic testing)*

Ipari terület: (Industrial sector): **Készülékek, berendezések, létesítmények vizsgálata EM (Pre and in-service testing of equipment, plant and structure)**

Termék terület(ek): (Product sector(s)): *(c)+Fv, (w)+Fv, (wp)+Fv, (f)+Fv*

A minősítés fokozata: (The level of certification): *UT2*

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): *Budapest, 2009. 12. 07.*

A tanúsítás érvényes: (The date upon which certification expires): *2014. 12. 06.*

Tanúsító Testület nevében (On behalf of certifying body)

Vizsgáztató (Examiner)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to): 9/2001 GM, 97/23 EC

Kijelölés: 9/2001 GM 067/2004 GM

Dátum (Date): 2009.12.04.

Vizsgáztató (Examiner)

A tanúsítás érvényessége -ig megújítva (MSZ EN 473 9.):
(Renewed the validity of the certification until (MSZ EN 473 9.):)

Dátum (Date): _____

Tanúsító Testület nevében (On behalf of certification body)

SZEMÉLYTANÚSÍTÓ NAT-5-0013/2006

A Magyar Hegesztéstechnikai és Anyagvizsgálati Egyesülés, mint a Nemzeti Akkreditáló Testület által a **NAT-5-0013/2006** számon akkreditált tanúsító testület az MSZ EN 473 számú szabvány szerint eredményes vizsgája alapján a nevezett személyt tanúsítja a fentiek szerint:
(The Hungarian Association of Welding Technology and Material Testing as an accredited by the National Accreditation Board (under No. NAT-5-0013/2006) certification body, on the basis of his/her successful examination under the standard MSZ EN 473, hereby certifies the named individual according to the above:)

UT20103090307

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon. (MSZ EN 473 3.21)

(The holder of this certificate has been authorised to perform tests and take responsibility for the test results. (MSZ EN 473 3.21)

GAMMA - CONTROLL KFT
6722 Szeged, Gyertyámos u. 14-16/A
Adószám: [illegible]
OTP Bank: 11738085-20406154
www.gamma-controll.hu
Tel.: 06 30 218-2640

Munkáltató aláírása:
(Signature of the employer:)

Dátum: 2009.12.07.
(Date:)

Folyamatos munkavégzés igazolása (MSZ EN 473 9.)
(Evidence of continued work activity (MSZ EN 473 9.))

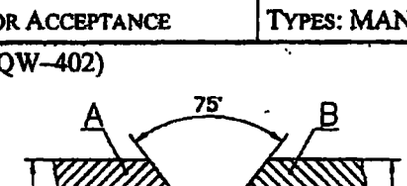
Sorsz.:	Munkáltató aláírása (Signature of the employer)	(Stamp)	Dátum (Date)
1.		"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2010.01.04.
2.		"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2011.01.06.
3.		"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2012.01.09.
4.		"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2013.01.09.
5.			
6.			
7.			
8.			
9.			
10.			

Kiegészítések:
(Additional remarks:)

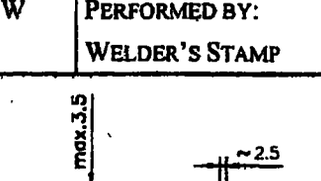
PHOENIX RUBBER INDUSTRIAL LTD.	TECHNICAL DATA SHEET	TDS	Page
	WELDING PROCEDURE SPECIFICATION	WPS	N° 1 of 2

CLIENT IDENTITY CODE	THIS SPECIFICATION IS BASED ON ASME CODE SECTION IX	WPS N° 140–71 REV 4 SUPPORTING PQR N° BUD 0700002/1
ITEM Qty DATA FOR ACCEPTANCE	WELDING PROCESS: GTAW-SMAW TYPES: MANUAL	PERFORMED BY: WELDER'S STAMP

JOINTS (QW–402)



JOINT DESIGN BACKING: YES/NO



Sequences of weld see on addendum

WELD SEQUENCE

BASE METALS (QW–403)			PART „A"	PART „B"
DRW N°				
GRADE:		WNo.:1.7220	ASTM A 322-91: AISI 4130 / 34CrMo4 (MSZ EN 10083-1) *	
CARBON EQUIVALENT		max.C_e =	0.82	0.82
MECHANICAL PROPERTIES:				
TENSILE STRENGTH	N/mm^2	min.	655	655
DUCTILITY	%	min.	18	18
HARDNESS	HB	max.	238	238
IMPACT TEST -30°C	J	Average	27	27
THICKNESS:	t = 5-38 mm		OUTSIDE DIAMETER :	ØD = 60-280 mm

FILLER METALS (QW–404)

WELD MATERIAL	DIAMETER	BRAND	STANDARD	SUPPLIER
Rod	2.4 mm	EML 5	AWS A5.18-01: ER70S-3	Böhler
Electrode	3.2; 4.0	T-PUT NiMo 100**	AWS A 5.5-96: E 10018-D2 (mod.)	Böhler

LAPSE BETWEEN OF PASSES MIN./min

POSITIONS (QW–405)	PREHEAT (QW–406)
POSITIONS: 1G Rotated (horizontal)	PREHEAT TEMP.: 300-330 °C
WELDING PROGRESSION: Weld flat at or near to the top	INTERPASS TEMP.: max. 350 °C
POSITION OF FILLET	PREHEAT MAINTENANCE: Till the begining of postweld heat threating
OTHER	METHOD OF PREHEATING: Furnace

CONTINUATION OF WPS N° 140–71 Rev.4							Page N° 2 of 2
POSTWELD HEAT TREATMENT (QW–407)				GAS (QW–408)			
HOLDING TEMP. RANG 620 +20 / -0 C°				SHIELDING GAS Argon for root			
HOLDING TEMP. TIME 4 HR				PERCENTAGE COMPOSION (MIXTURE)			
HEATING RATE MAX.:				99.995 %			
COOLING RATE MAX.: 80 °C/HR				FLOW RATE 10-12 LITRES/min.			
LOCATION OF THERMOCOUPLE				GAS BACKING: Argon (for 1st and 2nd passes)			
FURNACE ATMOSPHERE Air				FLOW RATE 7-9 Litres/min			
TYPE:				TRAILING SHIELDING GAS COMP.			
ELECTRICAL CHARACTERISTICS (QW–409)						1st pass: -	
CURRENT DC				ELECTRODE POLARITY :		2nd-28th passes: +	
TUNGSTEN ELEKTRODE SIZE/TYPE: Ø3.2 mm thoriated tungsten							
MODE OF TRANSFER FOR GMAW							
ELECTRODE / WIRE FEED SPEED RANGE							

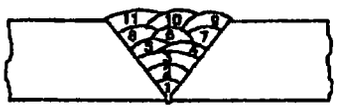
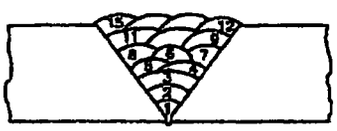
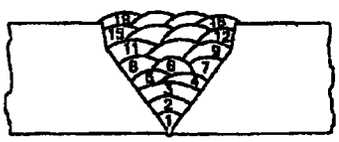
WELD LAYERS	PROCESS	FILLER METAL CLASS	FILLER METAL DIAMETER	CURRENT TYPE POLAR.	CURRENT AMP. RANGE	VOLT RANGE	HEAT INPUT (KJ/cm)
1	GTAW	EML 5	2.4 mm	-	110-130	11-12	5-8.4
2-3	SMAW	T-PUT NiMo 100	3.2 mm	+	120-140	24-26	12-19.6
4-28	SMAW	T-PUT NiMo 100	4.0 mm	+	150-170	26-30	16.2-27.5

TRAVEL SPEED RANGE 100-130 mm/min							
TECHNIQUE (QW–410)							
STRING OR WEAVE BEAD				ORIFACE OR GAS CUP SIZE Ø9mm			
INITAL/INTERPASS CLEANING: Brushing, Grinding							
EQUIPMENTS FOR WELDING:							
OTHER:							

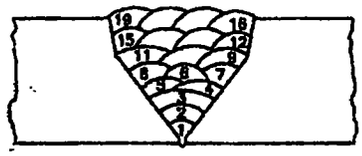
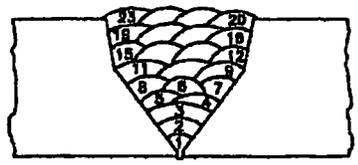
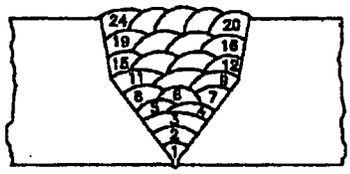
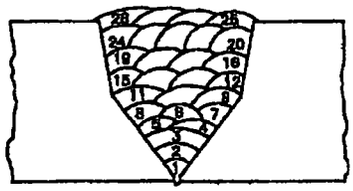
EXAMINATION –	REMARKS
Acc. to the acceptance instruction N° MIO-FB 2 Based on ASME IX.	- * Formerly CMo3 (MSZ 61) - ** Ni content less than 1 % - Before welding bake electrodes for 2 hours at 350 °C

	BY	DATE	TECHNICAL DATA SHEET	
Desig.	Bozó	14.06. 2007	WELDING PROCEDURE SPECIFICATION	HOSETECHNICAL
Appr.	Peter	14.06 2007	SUBJECT: Butt weld of hose coupling for H2S service;	DEPARTMENT
Chek'd			Strenght 75K	WPS N° 140-71 Rev.4

PHOENIX RUBBER Industrial Ltd. Hose Division	N°:	WPS 140-71 Addendum
	Revision:	4
	Page N°:	1/2
ADDENDUM for the approved wall thickness range 5-38 mm Based on WPS 140-71 Rev.4, PQR No.: BUD 0700002/1	Date:	2007-06-12
	Designed:	
	Checked:	
	Approval:	

No.	Wall thickness [mm]	Weld layers		Electrode Ø [mm]
1.	5-7		1 2	3,2 3,2
2.	7-9		1 2-3	3,2 3,2
3.	9-11		1 2-3 4-5	3,2 3,2 4,0
4.	11-13		1 2-3 4-6	3,2 3,2 4,0
5.	13-15		1 2-3 4-8	3,2 3,2 4,0
6.	15-18		1 2-3 4-10	3,2 3,2 4,0
7.	18-20		1 2-3 4-11	3,2 3,2 4,0
8.	20-22,22		1 2-3 4-15	3,2 3,2 4,0
9.	22,2-26		1 2-3 4-19	3,2 3,2 4,0

PHOENIX RUBBER Industrial Ltd.	N°:	WPS 140-71 Addendum
ADDENDUM for the approved wall thickness range 5-38 mm Based on WPS 140-71Rev.4, PQR No.: BUD 0700002/1	Revision:	4
	Page N°:	2/2

No.	Wall thickness [mm]	Weld layers		Electrode Ø [mm]
10.	26-29		1 2-3 4-19	3,2 3,2 4,0
11.	29-32		1 2-3 4-23	3,2 3,2 4,0
12.	32-35		1 2-3 4-24	3,2 3,2 4,0
13.	35-38		1 2-3 4-28	3,2 3,2 4,0

Certificate no: BUD 0700002/1
Page 1 of 2

Lloyd's Register

Welding Procedure Qualification Record (PQR) ASME IX

Energy and Transportation

Company Name: Phoenix Rubber Gumilpari Kft, SZEGED

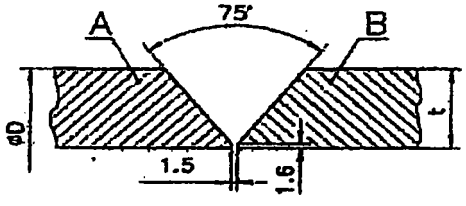
Procedure Qualification Record No. BUD 0700002/1 Date 28 February 2007

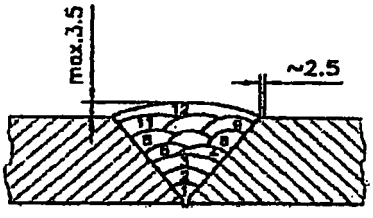
WPS No. 140-71

Welding Process(es) GTAW/SMAW

Types (Manual, Automatic, Semi-Auto.) Manual

Joints (QW-402)





Groove Design for Test Coupon
(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used.)

Base Metals (QW-403)

Material Spec.	ASTM A 322-91, AISI 4130
Type or Grade	AISI 4130
P.No.	AISI 4130 to P-No. AISI 4130
Thickness of Test Coupon	19 mm
Diameter of Test Coupon	72 mm
Other	

Postweld Heat Treatment (QW-407)

Temperature	620 +20-0 °C
Time	4 hours
Other	

Gas (QW-408)

	Percent Composition (Gas(es))	(Mixture)	Flow Rate
Shielding	Ar 99.95%		10-12 l/min
Trailing			
Backing	Ar 99.95%		7-9 l/min

Filler Metals (QW-404)	GTAW	SMAW
SFA Specification	ER 705-3	E 10018-G
AWS Classification	A5.18	A5.5
Filler Metal F-No.	6	4
Weld Metal Analysis A-No.	1	2
Size of Filler Metal	2.4 mm	3.2, 4.0 mm
Other		
Weld Metal Thickness	3 mm	16 mm

Electrical Characteristics (QW-409)

Current	DC		
Polarity	GTAW DCEN, SMAW DCEP		
Amps.	Layer 1 120, Layer 2-3 127, Layer 4-12 156	Volts	Layer 1 11-12, Layer 2-3 24-26, Layer 4-12 25-30
Tungsten Electrode Size	3.2 mm		
Other			

Position (QW-405)

Position of Groove 1G rotated

Weld Progression (Uphill, Downhill)

Other

Technique (QW-410)

Travel Speed Layer 1-11 100-130 Layer 12 mm/min

String or Weave Bead Layer 1-11 String Layer 12 Weave

	GTAW	SMAW
Multipass or Single Pass (per side)	S	M
Single or Multiple Electrodes	S	M

Heat input Layer 1 6.0-8.6 KJ/cm
Layer 2-3 14.1-19.8 KJ/cm
Layer 4-12 18.7-28.1 KJ/cm

Preheat (QW-406)

Preheat Temp. 300-330 °C

Interpass Temp max 350 °C

Other

Certificate no: BUD 0700002/1
Page 2 of 2

Tensile Test (QW-150) PQR No. BUD 0700002/1

Specimen No.	Width mm	Thickness mm	Area mm²	Ultimate Total Load kN	Ultimate Unit Stress MPa	Type of Failure & Location
39/1	18.9	15.8			657	Base material
39/2	18.9	15.7			664	Base material

Guided Bend Tests (QW-160)

Type and Figure No.	Results
180° Bend roller dia. 36 mm 2+2 pcs.	Satisfactory

Toughness Tests (QW-170)

Specimen No.	Notch Location	Specimen Size mm	Test Temp. °C	Impact Value J	% Shear	Mils	Drop Weight Break (Y/N)
39	S	10x10x55	-30	33			
39	S	10x10x55	-30	49			
39	S	10x10x55	-30	41			
39	HAZ	10x10x55	-30	38			
39	HAZ	10x10x55	-30	97			
39	HAZ	10x10x55	-30	62			

Comments:

Fillet Weld Test (QW-180)

Result– Satisfactory: Yes ☐ No ☐ Penetration into Parent Metal: Yes ☐ No ☐

Macro - Results

Other Tests

Type of Test	Hardness test
Deposit Analysis	
Other	Macro - Satisfactory X-ray - Satisfactory
Welder's Name	Tivadar Szabo DC-IL 378258
Clock No.	(BC 15)
Stamp No.	
Test Conducted By:	DKG EAST Anyagvizsgalati Labor.
Laboratory Test No:	TMO 007-7/07 VJK 1207/2007

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Date Issued: 28 February 2007

Lloyd's Register EMEA Budapest Office

Manufacturer's Representative Laszlo Bajusz

Manufacturer Phoenix Rubber Gumipari Kft, SZEGED

Laszlo Penzes
Surveyor to Lloyd's Register EMEA

A member of the Lloyd's Register Group

CONTITECH

Fluid Technology

WELDER'S APPROVAL TEST CERTIFICATE - ASME CODE IX

Examiner or test body: ABS Registration No.: RK1825997.R1

Designation ASME IX: GTAW / SMAW Pipe BW s19 1G

Welder's name: Tivadar Szabó (BC15)

Identification card No: 517278EA

Date and place of birth: 19. August 1949; SZEGED

		Weld test details	Range of approval	Photo (if required)
Welding process		GTAW/SMAW		
Filler metal	Type	Rod / Electrode		
	Designation	AWS 5.18: ER70S-3 AWS 5.5: E9018		
Parent metal group(s)		ASTM A 322-91; AISI 4130	ASTM A 322-91; AISI 4130	
Plate or pipe		Pipe	Pipe/Plate	
Welding position		1G	1G/Flat	
Outside diameter (mm)		72 mm	> 25 mm	Identification of test pieces:
Test piece thickness (mm)		19	Max to be welded	
Single/ both side welding		Single		WPS No.: ***140-60 Rev.4***
Gouging/ backing				
Joint type		Groove	Groove / Fillet	Testing standard: ***ASME IX***
Shielding/ backing gas(ses)		Argon (99,95%)		

Welding carried out, place: Szeged Date: 29 April 2010
Welding Engineer: László Bajusz

Type of test	Performed and accepted	Not required
Visual	Accepted (Vjk-1739/10)	
Radiography	Accepted (Vjk-1739/10)	
Ultrasonic		+
Magnetic particle		+
Penetrant		+
Macro		+
Fracture		+
Bend		+
Additional tests		+

Place and date:

Szeged, 18-Jun-2010

Surveyor:

Péter Szabó

Stamp and signature:

ABS AMERICAN BUREAU OF SHIPPING PÉTER SZABÓ BUDAPEST HU

See attached page(s) for prolongation by employer every 6 months

Continental CONTITECH

Fluid Technology

WELDER'S APPROVAL TEST CERTIFICATE - ASME CODE IX

Examiner or test body: ABS Registration No.: RK1825997.R1

Welder's name: Tivadar Szabó (BC15)

Identification card No.: 517278AE

Date and place of birth: 19. August 1949; SZEGED

PROLONGATION OF APPROVAL BY EMPLOYER			
Place	Date	Name/ position/ title	Stamp and signature
Szeged	29.10.2010.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.04.2011.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.10.2011.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.04.2012.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.10.2012.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.04.2013.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.10.2013	Laszlo Bajusz / Welding technologist	Bacsel

JE-ZO KFT. 6728 Szeged, Külterület 01408/22 hrsz. Adószám: 13341039-2-06 Bankszámlaszám: 12067008-00127077-00100001	WELDING LOG SHEET HEGESZTÉSI MUNKALAP	WLS Nº. Száma: 2013. / 2898. PAGE /oldal 1/1

CLIENT Megrendelő	CONTITECH RUBBER Industrial Kft.	PURCH.ORDER Nº. Rendelésszám	32261598.
CONTRACT Nº. Kötésszám	SPOOL/JOB Nº. Üzemi m.szám 2898 – 2905.	WPS Nº. Heg.ut.száma	140 -71. Rev. 4. / 7
NAME OF WEDED PARTS Heg. alkatrész megnevezése	Body + Flange	DRWG Nº. Rajzszám	HT 3121 - 3000.
NAME/ Nº. OF WELDER Hegesztő neve és száma	Szabó Tivador László. B.C. 15.	LOCATION/SHOP Munkavégzés helye	Szeged. Tápé Széle 6.
DATE Dátum 2013. 10. 25	QUANTITY Darabszám 8.	SERIAL NUMBERS Sorszámok	8083 - 8090.

1. MATERIAL CONTROL Anyag megfelelőség azonosítása	SUBJECT 1 Tárgy 1	body	MATERIAL Anyag	AISI. 4130.	CAST Nº. Adagszám	24613, 8083-8088; 23171, 8089-8090
	SUBJECT 2 Tárgy 2	Flange	MATERIAL Anyag	AISI. 4130.	CAST Nº. Adagszám	034939.

2. FILLER METAL Elektróda minőség és méret	WELD LAYERS Varratszám	1.	2-3.	4-11.	
	TYPE Típus	FW. 5.	NIMO. 100.	NIMO. 100.	
	DIAMETER Átmérő	2.4.	3.2.	4.	
	FILLER CAST Nº. Elektr.adagszám	800303.	1124075	1127750.	
3. ELECTRICAL CHARACTERISTICS Elektromos adatok	TYPE POLAR Polaritás	–	+	+	
	VOLT (V)	12.	24.	26.	
	AMPERE (A)	180.	140.	180.	

4. PRE HEAT TREATMENT OF ELECTRODES Elektróda felhasználást megelőző hőkezelése	300. C°	8. Hours

5. APPLIED SHILDING GAS Alkalmazott védőgáz	TYPE Típus Argon.	Percentage Composition Tisztaság. 99.95. %	Flow Rate Áramlási seb l/min 8.
6. HEAT TREATMENT (pre-weld) Előmelegítés 300. C°		7. POSITION Helyzet Forgatott.	
8. SPEED OF TRAVELS Hegesztési sebesség 100÷130. mm/min		9. LAPSE BEETWEN OF PASSES Varratfelrakási szünetek 8. min	

10.POSTWELD HEAT TREATMENT Utóhőkezelési adatok	Time Idő	Temperature Hőmérséklet	Furnace atmosph. Hűtőközeg	Cooling rate Hűlési sebesség
	240. min	620. C°	Levegő.	80. C°/H

11. RADIOGRAPHIC TEST CERT. Nº. Radiográfiai vizsg. biz. száma: 2450/13, 2451/13

REPAIR Javítás	YES/ Igen	X NO/ Nem
	PLACE OF DEFECT Hiba helye	TYPE OF DEFECT Hiba típusa
	METHOD OF REPAIR Javítási módszer	

VISUAL INSPECTION Szemrevételezés: Megfelelő / Satisfactory.

REMARKS Megjegyzés: Fronius. Magic. Wave. 2600.

Date, end of coling down time Dátum, kihűlés vége	WELDER Hegesztő	INSPECTOR Ellenőr
2013. 10. 26. – 13. óra	MINŐSÍTETT HEGESZTŐ KÖZKERESETI TÁRSASÁG 6753 Szeged, Tápé széle 6. Lev.: 6753 Szeged, Heller köz 1. Adószám: 20747290-2-06 (3.) BC 15	JE-ZO KFT. 6728 Szeged, Külterület 01408/22 hrsz. Adószám: 13341039-2-06 Bankszámlaszám: 12067008-00127077-00100001 DATE Dátum 2013 NOV 04

Felado : 61344 gamma controll kft 19/10/13 12:58 Lap: 1

GAMMA-CONTROLL www.gamma-controll.hu 6750 Algyő, Külterület 01534/14. hrsz. Tel./Fax.: +36 62/517-400 / 61344 A NAT által NAT-1-1140/2010 számon akkreditált vizsgálólaboratórium	**SZEMREVÉTELEZÉSES VIZSGÁLATI JEGYZŐKÖNYV** VISUAL EXAMINATION REPORT	Record No. Jegyzőkönyv száma: **813/13**

Object Tárgy	**Coupling welding** **Csatlakozó hegesztés**	Serial No. Gyári szám	**8083-8090**
Customer Megrendelő	**JE-ZO Kft. Szeged**	Drawing No. Rajzszám	**MT-3121-3000**
Job Nr. Munkaszá	**002/13**	Material/Dimension Anyagminőség/méret	**AISI 4130** **115/77**
Quantity Mennyisé	**8 db**	Extent of examination Vizsgálat terjedelme	**100%**
Requirements Követelmények	**ASME code VIII/1**	Heat treatment Hőkezelés	**after PWHT**
Written Procedure No. Vizsgálati eljárás száma	**QCP-09-1**	Welder Hegesztő	**BC15**

Visual examination / Szemrevételezéses vizsgálat

Technique Módszer	Direct visual	-
Instrument Készülék	-	-
Visual aids Segédeszközök	3x magnifiying lens	-

Measurement / Mérés

Equipment Készülék	-		-
Instrument Készülék	-		-
Surface temperature A felület hőmérséklete	20 °C	Surface condition Felület állapota	machined
Lighting intensity Megvilágítás	1000lx		

Test results
Eredmények :

SATISFACTORY

megfelelő.....8 pc(s)/db

not accepted

nem megfelelő.....0 pc(s)/db

Vizsgálat helye és ideje: Place and date of test:	Vizsgálatot végezte: Tested by:	Áttekintette és jóváhagyta: Reviewed and approved by:
Gamma-Controll Kft. Algyő, 2013.10.30. (10h)	Kis Gábor VT20103130102	GAMMA - CONTROLL KFT. 6750 Algyő, Külterület 01534/14. hrsz. Adószám: 11094614-2-06 www.gamma-controll.hu Tel.: 62/517-400

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **VT20103130102**

A tanúsított neve: (The name and forename of the certificated individual): ***Kis Gábor Balázs***

Születési hely/idő: (Place and date of birth): ***Szeged, 1980. 02. 29.***

A tanúsított személy aláírása
(The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): ***Szemrevételezéses anyagvizsgáló (Visual testing)***

Ipari terület: (Industrial sector): **Készülékek, berendezések, létesítmények vizsgálata EM (Pre and in-service testing of equipment, plant and structure)**

Termék terület(ek): (Product sector(s)): ***(c), (w), (wp), (f)***

A minősítés fokozata: (The level of certification): ***VT2***

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): ***Budapest, 2013. 02. 19.***

A tanúsítás érvényes: (The date upon which certification expires): ***2018. 02. 18.***

Tanúsító Testület nevében
(On behalf of certifying body)

Vizsgáztató
(Examiner)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to):

Dátum (Date): _____

Tanúsító Testület nevében
(On behalf of certifying body)

A tanúsítás érvényessége _____ **-ig megújítva (MSZ EN ISO 9712 10.):**
(Renewed the validity of the certification until (MSZ EN ISO 9712 10.):)

Dátum
(Date): _____

Tanúsító Testület nevében
(On behalf of certification body)

c - öntvények (castings); f - kovácsolt termékek (forgings); w - hegesztett és forrasztott termékek (welded products); t - csövek és csővezetékek (tubes); wp - alakított termékek (wrought products); k – komplett gépek (complete

VT20103130102

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

* **Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon.** (MSZ EN ISO 9712 3.21)
(The holder of this certificate has been authorized to perform tests and take responsibility for the test results. (MSZ EN ISO 9712 3.21))

GAMMA CONTROLL KFT.
6726 Szeged, Tűzok u. 8/A
Adószám: 11004614-2-06
K&H Bank: 11735005-20400134
www.gamma-control.hu
Tel.: 06-30-318-2510

Munkáltató aláírása: _____ **Dátum:** 2013.02.06.
(Signature of the employer) (Date:)

Folyamatos munkavégzés igazolása (MSZ EN ISO 9712 10.)
(Evidence of continued work activity (MSZ EN ISO 9712 10.))

Sorsz.:	Munkáltató aláírása (Signature of the employer)	Ph. "GAMMA CONTROLL." Anyagvizsgáló és Minőségellenőrző Kft.	Dátum (Date)
1.			2013.02.06.
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Kiegészítések:
(Additional remarks:)

* A tanúsítvány a munkáltató aláírásával érvényes
(This certificate is valid with ...)

Felado : 61344 gamma controll kft 19/10/13 12:54 Lap: 1

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, külterület 01884/14. hrsz.
Tel./Fax.: +36 62/577-400 / 61344
A NAT által NAT-1-11402/2012 számon akkreditált vizsgálólaboratórium

RADIOGRÁFIAI VIZSGÁLATI JEGYZŐKÖNYV

RADIOGRAPHIC EXAMINATION REPORT

Jegyzőkönyv szám: / Report No.: **2431/13**

Kiállítás dátuma: / Date of report: **2013.10.30**

Vizsgálat tárgya: / Object:	Coupling	Megrendelő: / Client:	JE-ZO Kft. Szeged
Munkaszám: / Job No.:	—	Rendelési szám: / Order No:	—
Rajzszám: / Drawing No.:	MT-3121-3000	Anyagminőség: / Material:	AISI 4130
Vizsgálati szabvány: / Testing standard:	QCP-13-1	Vizsgálat terjedelme: / Extent of testing:	100%
Átvételi követelmény: / Acceptance criteria:	ASTM E94	Hőkezelés: / Heat treatment condition:	After PWHT
Kód: / Code:	MSZ EN ISO 6520-1	Hegesztő jele: / Welder stamp:	BC15
Berendezés típusa: / Type of equipment:	GAMMAMAT	Képminőségjelző típusa: / Type of IQI:	ASTM set B type
Sugárforrás: / Source:	Ir192	Képminőség jelző helye: / Placement of IQI:	F
Sugárforrás mérete: / Source size:	3x1,5mm	Előírt képminőség: / Required IQI:	2% (2-2T)
Aktivitás: / Activity:	0,4 TBq	Film típus: / Film Type:	FOMA R5
Filmkidolgozás módja: / Film processing:	Kézi: / Manual: — Automata: / Automatic: X	Fóliafajta és vastagság: / Screen type and thick:	Pb 0,027

Megnevezés Designation	Méret Size ø	Felvételek száma: Number of radiographs: db	Anyagvastagság: Penetrated thickness: mm	Sugárforrás film távolság: Source-to-film distance: mm	Film tőv. a tárgy sugárforrás felőli oldalától: Distance from source side of object to film: mm	Feketedés: Density:	Megvilágítási idő: Expos. Time: min	Vizsgálat: Értékelés: Result: A=megfelelő Na=nem megfelelő/ A=accepted/ NA=not accepted	Vizsgálat időpontja: Date of test	Hibák/Defects					
										Gáz Porosity A	Salak Slag B	Kötés Lack of fusion C	Gyök Lack of penetration D	Repedés Crack E	Felület Surface F
										200	300	401	402	100	500
8083	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
8084	115/77	4	19	96	19	2,4	0,5	A	10.30 10h						
8085	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
8086	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
8087	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
8088	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						

A filmszámok és varratszámok azonosak, beazonosításuk a megrendelőt terheli.
The numbers of the films and welds are identical, their identification is the task of the costumer.

Vizsgálatot végezte: / Performed by: Ménesi I. - Szabó T.

Vizsgálat helye: / Place of test:	Értékelte: / Evaluated by:	Jóváhagyta: / Approved by:
6750 Algyő, Gamma-Controll Kft. Telephely	Ménesi István RT20101120107	GAMMA - CONTROLL KFT 6750 Algyő, Külterület 01884/14. hrsz. Adószám: 11924614-2-06 www.gamma-controll.hu Tel.: 06-30-218-2640 Felelős vezető

Felado : 61344 gamma controll kft 19/10/13 12:48 Lap: 1

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, Kőtermi út 0194/14. hrsz.
Tel./Fax.: +36 62/817-400 / 61344

RADIOGRÁFIAI VIZSGÁLATI JEGYZŐKÖNYV

RADIOGRAPHIC EXAMINATION REPORT

Jegyzőkönyv szám: Report No.: **2430/13**

Kiállítás dátuma: Date of report: **2013.10.30**

Vizsgálat tárgya: Object:	Coupling	Megrendelő: Client:	JE-ZO Kft. Szeged
Munkaszám: Job No.:	—	Rendelési szám: Order No:	—
Rajzszám: Drawing No.:	MT-3121-3000	Anyagminőség: Material:	AISI 4130
Vizsgálati szabvány: Testing standard:	QCP-13-1	Vizsgálat terjedelme: Extent of testing:	100%
Átvételi követelmény: Acceptance criteria:	ASTM F94	Hőkezelés: Heat treatment condition:	After PWHT
Kód: Code:	MSZ EN ISO 6520-1	Hegesztő jele: Welder stamp:	BC15
Berendezés típusa: Type of equipment:	GAMMAMAT	Képminőségjelző típusa: Type of IQI:	ASTM set B type
Sugárforrás: Source:	Ir192	Képminőség jelző helye: Placement of IQI:	F
Sugárforrás mérete: Source size:	3x1,5mm	Előírt képminőség: Required IQI:	2% (2-2T)
Aktivitás: Activity:	0,4 TBq	Film típus: Film Type:	FOMA R5
Filmkidolgozás módja: Film processing:	Kézi: Manual: — Automata: Automatic: X	Fóliafajta és vastagság: Screen type and thick:	Pb 0,027

Megnevezés Designation	Méret Size ø	Felvételek száma: Number of radiographs: db	Árnyárnyat anyagvastagság: Projected thickness: mm	Sugárforrás film távolság: Source-to-film distance: mm	Film fölé a tárgy meghatározott részétől: Distance from source side of object to film: mm	Feketedés: Density:	Megvilágítási idő: Expos. Time: min	Minősítés: Értékelés: Result NA=nem megfelelő Acceptable NA=not accepted	Vizsgálat időpontja: Date of test	Hibák/Defects					
										Gáz. Porosity A	Salak Slag B	Kötés Lack of fusion C	Gyök Lack of penetration D	Repedés Crack E	Felület Surface F
										200	300	401	402	100	500
8089	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
8090	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

A filmszámok és varratszámok azonosak, beazonosításuk a megrendelőt terheli.
The numbers of the films and welds are identical, their identification is the task of the costumer.

Vizsgálatot végezte: Performed by: Ménesi I. - Szabó T.

Vizsgálat helye: Place of test:	Értékelte: Evaluated by:	Jóváhagyta: Approved by:
6750 Algyő, Gamma-Controll Kft. Telephely	Ménesi István RT20101120107	GAMMA - CONTROLL KFT 6750 Algyő, Kőtermi út 0194/14. hrsz. Adószám: 13946614-2-06 Vajda Miklós vezető@gamma-controll.hu Tel.: 06-30/215-2640

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **RT20101120107**

A tanúsított neve: (The name and forename of the certificated individual): ***Ménesi István***

Születési hely/idő: (Place and date of birth): ***Szentes, 1988. 09. 06.***

A tanúsított személy aláírása (The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): ***Radiográfiai anyagvizsgálat (Radiographic testing)***

Ipari terület: (Industrial sector): **Készülékek, berendezések, létesítmények vizsgálata EM (Pre and in-service testing of equipment, plant and structure)**

Termék terület(ek): (Product sector(s)): ***(c), (w)***

A minősítés fokozata: (The level of certification): ***RT2***

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): ***Budapest, 2012. 03. 28.***

A tanúsítás érvényes: (The date upon which certification expires): ***2017. 03. 27.***

Tanúsító Testület nevében (On behalf of certifying body)

Vizsgáztató (Examiner)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to):

Kijelölés: 9/2001 GM 067/2004 GKM 3023 EG

Dátum (Date): _____

Tanúsító Testület nevében (On behalf of certifying body)

A tanúsítás érvényessége -ig megújítva (MSZ EN 473 9.): (Renewed the validity of the certification until (MSZ EN 473 9.):)

Dátum (Date): _____

Tanúsító Testület nevében (On behalf of certification body)

A Magyar Hegesztéstechnikai és Anyagvizsgálati Egyesülés, mint „a Nemzeti Akkreditáló Testület által a **NAT-5-0013/2010** számon akkreditált személytanúsító szervezet" a nevezett személyt tanúsítja az MSZ EN 473 szerint eredményes vizsgája alapján a fentiek szerint:
(The Hungarian Association of Welding Technology and Material Testing as an "accredited certification body for person an by National Accreditation Board (under No. **NAT-5-013/2010"**, on the basis of his/her successful examination under the standard MSZ EN 473, hereby certifies the named individual according to the above:)

* c - öntvények (castings); f - kovácsolt termékek (forgings); w - hegesztett kötések-termékek (welded products); t - csövek (tubes); wp - alakított termékek (wrought products); p - műanyag termékek (plastics products); k - kompozitok (composites products).

RT20101120107

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon. (MSZ EN 473 3.21)
(The holder of this certificate has been authorised to perform tests and take responsibility for the test results. (MSZ EN 473 3.21))

GAMMA-CONTROLL Kft.
6726 Szeged, Tüzér u.
Adószám: 11094614-2-06
OTP Bank: 11735005-20406154
www.gamma-controll.hu
Tel.:06-30-218-2640

Munkáltató aláírása: (Signature of the employer:) _____ **Dátum:** (Date:) 2012.04.19.

Folyamatos munkavégzés igazolása (MSZ EN 473 9.)
(Evidence of continued work activity (MSZ EN 473 9.))

Sorsz.:	Munkáltató aláírása (Signature of the employer)	Ph. (Stamp)	Dátum (Date)
1.		"GAMMA-CONTROLL Anyagvizsgáló és Minőségellenőrző Kft."	2012.04.19.
2.		"GAMMA-CONTROLL Anyagvizsgáló és Minőségellenőrző Kft."	2013.06.09.
3.			
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Kiegészítések:
(Additional remarks:)

ContiTech Rubber Industrial Kft. Szeged/Hungary	**Examination record Vizsgálati jegyzőkönyv** **Liquid penetrant examination Festékdiffúzlós vizsgálat** ☒ **Magnetic particle examination Mágneses repedésvizsgálat**	Record No. Jegyzőkönyv száma : 1222/13

Manufacturer Gyártó	JE-ZO Kft.	Serial No. Gyári szám	8083-8090
Customer Megrendelő	ContiTech Rubber Industrial Kft.	Drawing No. Rajzszám	MT 3121-3000
Object Tárgy	coupling(s)	Material Anyagminőség	AISI 4130
Quantity Mennyiség	8 pc(s)	Extent of examination Vizsgálat terjedelme	100 % outside
Requirements Követelmények	ASTM E 709	Heat treatment Hőkezelés	yes
Written Procedure No. Vizsgálati eljárás száma	QCP-11-1	Welder: Hegesztő:	Szabó T.

Liquid penetrant examination /Folyadékbehatolásos vizsgálat

Penetrant Behatoló anyag	Remover Tisztító	Developer Előhívó
Dwell time Behatolási idő	Drying Szárítás	Developing time Előhívási idő
Surface temperature A felület hőmérséklete	Surface condition Felület állapota	Lighting intensity Megvilágítás

Magnetic particle examination/Mágnesezhető poros vizsgálat

Equipment type Készülék típusa	TSW 1000	Testing material Vizsgáló anyag	MR 76F	Magnetizing current Mágnesező áram	1000 A
Black light type UV-A lámpa típusa	Superlight C 10A-HE	Field strength checking Térerőmérő	Berthold disc	Field strength Térerő	4,2 kA/m
Surface temperature A felület hőmérséklete	23 °C	Surface condition Felület állapota	machined	Lighting intensity Megvilágítás	1000 µW/cm²

Test results
Eredmények :

satisfactory
megfelelő.....8..... pc(s)/db

not accepted
nem megfelelő.....-..... pc(s)/db

Performed by NDE Level II. Vizsgálatot végezte	Revised by Q.C. manager Ellenőrizte – MEO vezető
Signature Oravecz Gábor	Signature Markó László
Aláírás	Aláírás
Place/Date	Place/Date
Kelt Szeged, 04.11.2013.	Kelt Szeged. 04.11.2013.

ContiTech Rubber Industrial Kft. QC3

ContiTech Rubber Industrial Kft. QC 1

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **MT20103010506Ú**

A tanúsított neve: (The name and forename of the certificated individual): ***Oravecz Gábor***

Születési hely/idő: (Place and date of birth): ***Szeged, 1958. 07. 07.***

A tanúsított személy aláírása
(The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): ***Mágnesezhető poros anyagvizsgáló (Magnetic particle testing)***

Ipari terület: (Industrial sector): **Fémfeldolgozás MM (Metal manufacturing)**

Termék terület(ek): * Product sector(s): ***(c), (f), (w), (wp)***

A minősítés szintje: (The level of certification): ***MT2***

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): ***Budapest, 2012. 02. 21.***

A tanúsítás érvényes: (The date upon which certification expires): ***2017. 02. 20.***

Tanúsító Testület nevében
(On behalf of certifying body)

Vizsgáztató
(Examiner)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to):

Dátum (Date): _____

Tanúsító Testület nevében
(On behalf of certifying body)

A tanúsítás érvényessége **-ig megújítva (MSZ EN 473 9.):**
(Renewed the validity of the certification until (MSZ EN 473 9.):)

Dátum (Date): _____

Tanúsító Testület nevében
(On behalf of certification body)

A Magyar Hegesztéstechnikai és Anyagvizsgálati Egyesülés, mint „a Nemzeti Akkreditáló Testület által a **NAT-5-0013/2010** számon akkreditált személytanúsító szervezet" a nevezett személyt tanúsítja az MSZ EN 473 szerint eredményes vizsgája alapján a fentiek szerint:
(The Hungarian Association of Welding Technology and Material Testing as an "accredited certification body for person an by National Accreditation Board (under No. **NAT-5-013/2010**", on the basis of his/her successful examination under the standard MSZ EN 473, hereby certifies the named individual according to the above:)

* c - öntvények (castings); f - kovácsolt termékek (forgings); w - hegesztett kötések-termékek (welded products); t - csövek (tubes); wp - alakított termékek (wrought products); p - műanyag termékek (plastics products); k - kompozitok (composites products).

MT201030105O6Ú

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon. (MSZ EN 473 3.21)
(The holder of this certificate has been authorised to perform tests and take responsibility for the test results. (MSZ EN 473 3.21))

Munkáltató aláírása: (Signature of the employer:) _____ **Dátum:** (Date:) 2012. 02. 21.

Folyamatos munkavégzés igazolása (MSZ EN 473 9.) (Evidence of continued work activity (MSZ EN 473 9.))			
Sorsz.:	Munkáltató aláírása (Signature of the employer)	Ph. (Stamp)	Dátum (Date)
1.		ContiTech Rubber Industrial Kft. Quality Control Dept. (1)	2013. 01. 24.
2.			
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Kiegészítések:
(Additional remarks:)

Bekaert Hlohovec a.s.
Mierová 2317
92028 Hlohovec / Slovakia
Tel:: 00421337383111
Fax:: 00421337422742

505760

STEELCORD
MANUFACTURER : BKHL

Page : 1 / 1

Certificate of Analysis
Delivery No. : 4046181212

Contitech Rubber Industrial Kft.
CONTITECH RUBBER IND SZEGED
Budapesti út 10
H-6728 SZEGED

Sales Order	3046059220/10
Purchase Order	32260330
Inspection lot	090000200665/000001
Batch	3500245379
Date produced	01.07.2013
Date COA	09.08.2013
Spools	32 delivered from a batch of 32 produced
Units	16 delivered from a batch of 16 produced
Delivery net Qty.	10517 KG
Material Description	Zinc coated steelcord 1X24DW/3.6 NT 20/36 ZZ B650 5000 M
Lay direction	ZZ
Lay length	20/36

Spec customer	Contitech Rubber Industrial Kft.
Your code	14-16-07/1
Your spec	REV.3 / 15.01.2002
Our Spec	H207297 / 26.10.2012

Tests			Specs		Results	
Test	Procedure	Unit	Aim	Min. Max.	Avg. N	Min ind Max ind
Cord diameter	RA12-100	mm	3,6000	3,4200 3,7800	3,6845 6	3,6640 3,6930
Linear density	RA30-110	g/m	65,000	61,700 68,300	65,632 6	65,300 65,870
Cord breaking strength	RA30-203	N		17900,0	19337,0 6	19087,0 19584,0
Cord elongation at break	RA30-203	%		2,50	2,98 6	2,80 3,15
Zinc D1	RA40-741	g/m2		32,000	40,057 6	37,870 44,630
Zinc D2	RA40-741	g/m2		44,000	48,788 6	45,350 55,100
Residual torsions	RA30-150	Nt	0,000	-3,000 3,000	-0,250 6	-0,500 0,000

Comments :
D1: 0,54
D2: 0,73

Nominal Chemical composition of High Grade Oxysteel:
%Carbon : 0.70-0.90
%Manganese: 0.40-0.60
%Silicon: <0.230
%S: <0.011
%P: <0.012

Microstructure/Texture: Metallurgically the texture is known as a higly drawn, fine perlitic structure.

Terninox S.p.A. con Unico Socio
Una società del gruppo ThyssenKrupp Acciai Speciali Terni
P.IVA 00682070655

Azienda con sistema di gestione certificato da IGQ secondo ISO 9001

ERTIFICATO DI COLLAUDO Conforme a EN 10204/ 3.1 n° : 63892/2012

25 x 4,6 mm

ecifica/Specification:
10088-2

Destinatario/Receiver:
ACCIAI VENDER S.P.A.
VIA A. NOBEL, 3/A
43100 PARMA

Cliente/Customer: ACCIAI VENDER S.P.A.
VIA A.NOBEL, 4/A Q.RE IND.LE S.P.I.P
43100 PARMA

Acciaio/Steel: 304PS

OUTSIDE STRIPWOUND TUBE

T/DEL. NOTE : 16753 **DEL/OF:** 24/05/2012 **Ordine/order Terninox :** P04249 **Ord. Cliente/Customer :**

ricola ial Number	Pos Item	Tipo Prodotto Product Type	Fin	Descrizione Description	Dimensioni(mm) Dimensions(mm)	Pezzi Pieces	Weight (Kg)	Rif. Cli. Cust. Ref.	Colata Heat	NIM
97 T33882	22	COIL	2B		0.60 x 460.0	1	6040		0431359	310727
89 T33887	27	NASTRI STRETTI	BA		0.79 x 284.7	1	1290		0431741	324612

ERIALE SOPRA ELENCATO E' STATO DIMENSIONALMENTE E/O SUPERFICIALMENTE TRASFORMATO DA TERNINOX SENZA ALTERARNE LE CARATTERISTICHE MECCANICHE E CHIMICHE
ATERIAL DESCRIBED ABOVE HAS BEEN DIMENSIONALLY AND/OR SUPERFICIALLY TRASFORMED BY TERNINOX WITHOUT CHANGING THE MECHANICAL AND CHEMICAL FEATURES

lisi di colata/Chemical Composition

lata/Heat	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	N %	Ti %	Cu %	Nb %	B %	Al %	Co %
0431359	0.045	0.300	1.290	0.027	0.001	18.000	9.040	0.260	0.024		0.310				
0431741	0.048	0.310	1.420	0.029	0.001	18.090	9.050	0.320	0.019		0.370				

ltati delle prove/Test Result (1N/mm²=1 M Pa)

NIM	Prelievo (1)	Senso (2)	Caric. unit. snervamento Yield strenght		Caric. unit. Rottura Tensile strength	Allungamento a rottura Ultimate elongation (%)			Durezza Hardness	Piega a Bend To 180°	Trat.termico Ricot. di solub. / heat treatment of annealing for solubiliz.	Resistenza alla corrosione intergranulare secondo / Resistance to corrosion intergranulare	Grano Grain
			RpO2% N/mm²	Rp1% N/mm²	Rm N/mm²	Lo =2"	Lo =80	Lo =A5	HRB				
310727	T	T	245	271	607		60.7		70.5		1050	EN ISO 3651-2	
	C	T	230	261	604		62.8		66.0				
324612	T	T	235	262	588		62.4		70.5	-	1050	EN ISO 3651-2	
	C	T	237	267	605		62.1		72.0				

ici e fisici sopra riportati sono tratti dal certificato di qualita' del nostro fornitore qualificato il cui originale e' in ns. possesso e disponibile su richiesta.
and physical data reported above are extracted from quality certificate emitted from our qualified supplier: the original document is in our posses and it is upon your request.
mo che i prodotti sopra elencati sono conformi alle prescrizioni dell'ordine/We certify that products listed above are compliant to order prescriptions

COMPLIES WITH ED 2000/53/EC

Certificato emesso automaticamente
Data/Date 24/05/2012
R. GOVONI

ITAL INOX HUNGÁRIA KFT.
1184 Budapest, Lakatos út 42/A.
Tel.: 297-1050, 291-6239 Fax: 290-5067
Adószám: 12141537-2-43
BAR Sz. 10900080-00000005-...

3.

500124
506520

ping
a - Top
da - Bottom

(2) Senso
T = Trasversale - Transverse
L = Longitudinale - Longitudinal

CONTITECH RUBBER Industrial Kft.
No:QC-DB- 651 /2013
Page: 41 / 44

MKEH
Metrológiai Hatóság/*Metrology Authority*
Mechanikai Mérések Osztály
Section of Mechanical Measurements
BUDAPEST XII., NÉMETVÖLGYI ÚT 37-39.
1535 Budapest, Pf. 919
Telefon: 458-5800
Telefax: 458-5927

Ügyiratszám / *File No.*:
MKEH-MH/00287-003/2013/NY
Bizonyítványszám / *Certificate No.*:
NYO - 0008/2013
Hivatkozási szám / *Reference No.*:
32259470
Page 1/3 oldal
Kiadva / *Issued*
Budapest, 2013. 01. 28. / *28 01 2013*

KALIBRÁLÁSI BIZONYÍTVÁNY
CALIBRATION CERTIFICATE

A kalibrálás tárgya:	**villamos kimenőjelű nyomásmérő**
Object of calibration:	***electrical-output manometer***
Gyártó / *Manufacturer*:	AFRISO-EURO-INDEX GmbH
Típus / *Type*:	DMU03 HD
Azonosító szám / *Serial No.*:	1518086
Műszaki adatok / *Technical data*:	(0...2500) bar méréstartomány / *measuring range (0...2500) bar*
	(4...20) mA kimenőjel tartomány / *output signal range (4...20) mA*
Kalibrálásra bemutatta:	ContiTech Rubber Industrial Kft.
Customer:	6728 Szeged, Budapesti út 10.
A kalibrálás helye és ideje:	**Magyar Kereskedelmi Engedélyezési Hivatal**
Place and date of calibration:	***Hungarian Trade Licensing Office***
	Metrológiai Hatóság, Mechanikai Mérések Osztály
	Metrology Authority, Section of Mechanical Measurements
	Budapest, 2013.01.24.
A kalibrálást végezte:	.....
Calibrated by:	**Szaulich Dénes**
	metrológus / *metrologist*

A kalibrálásnál alkalmazott etalonok:
Standards used for the calibration:

Megnevezés: *Designation:*	Gyártó: *Manufacturer*:	Típus: *Type*:	Gyártási szám: *Serial No.*:	Bizonyítvány szám: *Certificate No.*:
túlnyomás etalon / *pressure standard*	Budenberg	283	20603	NYO-0001/2013
digitális multiméter / *digital multimeter*	Keithley	2000	0597910	ELD-0014/2012
normál ellenállás / *resistance standard*	ZIP	P 331	117530	ELD-0021/2012
hőmérő / *temperature measuring instr.*	GANZ MM	DTH1	33656	Hőm-0296/2012

A mérési eredmények a nemzeti (nemzetközi) etalonra visszavezetettek.
The measuring results are traceable to national standards.

A kalibrálás módja:
Calibration method:
A kalibrálást a KE NYO-3-2002 számú kalibrálás eljárás alapján végeztük.
The calibration was done according to the calibration procedure No.: KE NYO-3-2002.

MKEH
Metrológiai Hatóság/*Metrology Authority*
Mechanikai Mérések Osztály
Section of Mechanical Measurements

Ügyiratszám / *File No.*:
MKEH-MH/00287-003/2013/NY
Bizonyítványszám / *Certificate No.*:
NYO - 0008/2013
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A kalibrálás körülményei:
Calibration conditions:

környezeti hőmérséklet / *Ambient temperature*	21,1 °C
a kalibrált eszköz helyzete / *Position of the calibrated manometer*	függőleges / *vertical*
a kalibrált eszköz tápfeszültsége / *Supply voltage of the calibrated manometer*	24V DC
nyomóközeg / *Pressure transfer medium*	olaj / *oil*

Mérési eredmények a (0...2500) bar nyomástartományban:
Results of the measurements in the pressure range of (0...2500) bar:

Nyomás, névleges érték *Pressure, nominal value* bar	Áram-kimenőjel, névleges érték *Current-Output, nominal value* mA	Áram-kimenőjel, mért eltérés a helyes értéktől *Current-Output, measured deviation from the reference value* mA	Nyomás, mért eltérés a helyes értéktől *Pressure, measured deviation from the reference value* bar	Eredő mérési bizonytalanság *Expanded uncertainty of the measurement* bar
0	4,0	-0,0042	-0,7	2,6
250	5,6	-0,0002	0,0	
500	7,2	0,0029	0,5	
750	8,8	0,0050	0,8	
1000	10,4	0,0063	1,0	
1250	12,0	0,0053	0,8	
1500	13,6	0,0033	0,5	
1750	15,2	-0,0003	-0,1	
2000	16,8	-0,0052	-0,8	
2250	18,4	-0,0117	-1,8	
2500	20,0	-0,0192	-3,0	

Mérési bizonytalanság: A mérési eredmény(ek) mellett közölve.
Uncertainty of measurement: *See next to the results of the measurements.*
A közölt kiterjesztett mérési bizonytalanság a standard bizonytalanságnak *k kiterjesztési tényezővel* szorzott értéke (k = 2), amely normális (Gauss) eloszlás feltételezésével közelítőleg 95%-os fedési valószínűségnek felel meg.
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to coverage probability of approximately 95 %.

A mérési bizonytalanság tartalmazza az etalonból, a kalibrálás módszeréből, a környezeti feltételekből, a kalibrált mérőeszközből stb. eredő részbizonytalanságokat.
It contains the uncertainties of the standards, calibration method, enviromental conditions, calibrated device etc.

A standard bizonytalanság meghatározása az EA–4/02 (Expression of the Uncertainty of Measurement in Calibration) kiadványnak megfelelően történt.
The standard uncertainty of measurement has been determined in accordance with the EA Publication EA 4/02 (Expression of the Uncertainty of Measurement in Calibration).

MKEH
Metrológiai Hatóság/*Metrology Authority*
Mechanikai Mérések Osztály
Section of Mechanical Measurements

Ügyiratszám / *File No.*:
MKEH-MH/00287-003/2013/NY
Bizonyítványszám / *Certificate No.*:
NYO - 0008/2013
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Bélyegzés:
Calibration mark:
A kalibrált mérőeszközön **K067662** azonosító számú kalibrálási bélyeget helyeztünk el.
*We have placed a calibration stamp No.: **K067662** on the calibrated instrument.*

Megjegyzések:
Additional remarks:
Jelen bizonyítvány összhangban van a Nemzetközi Súly és Mértékügyi Bizottság (CIPM) Kölcsönös Elismerési Megegyezése (MRA) C függeléke által tartalmazott kalibrálási és mérési képességekkel (CMCs). Az MRA minden aláíró intézete elismeri egymás kalibrálási és mérési bizonyítványait a C függelék szerinti mennyiségfajtákra, azok értéktartományaival és mérési bizonytalanságaival (közelebbit lásd: http://www.bipm.org)
This certificate is consistent with Calibration and Measurement Capabilities (CMCs) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures (CIPM). Under the MRA, all participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C (for details see http://www.bipm.org)

A kalibrálási bizonyítványban megadott értékek a mérőeszköznek a kalibrálás idejére és körülményeire jellemző adatai.
The measurement results show the metrological properties of the device during the time of the calibration under the environmental conditions listed above.

Az újrakalibrálás időpontját a felhasználó dönti el a mérőeszköz használatának és állapotának függvényében.
The date of the next calibration is decided by the user. It depends on the usage and the condition of the device.

A bizonyítvány kiadható / ***Approved by*:**

Magyar Kereskedelmi Engedélyezési Hivatal Metrológiai Hatóság 324.

Kálóczi László
osztályvezető / *Head of Section*

AMEREDEV

American Resource Development LLC

Requested Exceptions

- Variance is requested to connect the BOP choke outlet to the choke manifold using a co-flex line (instead of using a 4" OD steel line) with a 10,000 psi working pressure that has been tested to 15,000 psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps.

- Variance is requested to allow Option of rig not capable of reaching TD presetting Surface, Drilling Plan will be same using Fresh Water fluid system.

- Variance is requested to wave any centralizer requirements on the 5-1/2" casing. Ameredev will utilize cement expansion additives in the cement slurry to maximize cement bond and zonal isolation.

- Variance is requested to wave any centralizer requirements on the 9-5/8" casing. Ameredev will utilize cement expansion additives in the cement slurry to maximize cement bond and zonal isolation.

- Variance is requested to allow Temporary Postponement of Operations on well to skid to adjacent well if multiple wells on drilling pad are drilled.

- Variance is requested to allow use of Multi-Bowl Well Head System.

- Variance is requested to allow adjustment of Casing Design Safety Factor on conditions that Ameredev keeps minimum of 1/3 casing capacity filled with OMW drilling fluids.

- Variance is requested to allow 5M Annular Preventer on 10M BOPE System to drill Production Interval. (Supporting Documentation Attached)

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BUREAU OF LAND MANAGEMENT

PWD Data Report
05/03/2019

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Injection PWD discharge volume (bbl/day):

Injection well type:

Injection well number: **Injection well name:**

Assigned injection well API number? **Injection well API number:**

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

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U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Bond Info Data Report

05/03/2019

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001478

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: